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THE IMPORTANCE OF PLASMA PROTEIN CHANGES AND HÆMOCONCENTRATION IN SHOCK*

By Edward S. Mills, M.Sc., M.D., C.M., F.R.C.P.[C.] and
Major Alex. L. Gordon, R.C.A.M.C.

Montreal

THE present report deals with further observations of blood changes in patients suffering from shock due to trauma including burns and injuries with extensive blood loss. Studies of the hæmoglobin, the hæmatocrit and the plasma proteins were made at regular intervals from the time of admission of the patient to the hospital until the patient died or improved. By this means it was hoped to assess their importance in the etiology of shock and further to assist the surgeon in the management of the shocked patient.

In a report by the author to the National Research Council in 1943,[1] under whose ægis these studies were made, the conclusions were that hæmoconcentration and plasma protein loss though commonly encountered in severely shocked patients were not essential since severe degrees of shock were encountered in patients not showing either of these changes. Peripheral circulatory failure was frequently observed to occur before such changes took place or even without them. Further studies reported to the National Research Council in April, 1944,[2] confirmed the initial observations and emphasized the grave import of continued hypoproteinæmia.

This present report furnishes additional clinical and laboratory data in support of the original contentions. In correlating the clinical with the laboratory observations it is possible to explain why in some instances at least, severely shocked patients show normal values. The extravasation of a large amount of blood into traumatized tissues or concealed hæmorrhage as in hæmoperitoneum reduces the volume of circulating blood which tends to be restored by fluid from tissues or gut. There is, however, during this process, a loss of red cell volume and of plasma proteins. This is hæmodilution. If shock continues there may be further loss of plasma so that the hæmatocrit may now show perfectly normal values. These apparent normals actually result from a combination of two important changes: whole blood loss followed by varying degrees of hæmodilution, and hæmoconcentration. The overall picture must be carefully scrutinized and the laboratory data interpreted in the light of a comprehensive knowledge of the nature and extent of the patient's injuries and his physical state in general. Only in this way can serious mistakes be avoided. One corollary of these apparently normal values for hæmatocrit and plasma proteins is the fact that shock cannot be due fundamentally to any changes in the plasma-cell ratio or in the plasma protein concentration. From the etiological point of view they are but contributory factors.

The importance of muscle tone in maintaining the circulation has long been recognized. In a recent publication Heustell and Gunther[3] have reported observations on changes in intramuscular pressure in shock. They have found that peripheral circulatory failure may occur with normal or unchanged plasma volume and suggest that reduction in intramuscular pressure may be a more important factor. These findings add to the already complicated mosaic pattern of shock.

DISCUSSION OF EIGHT SHOCK-TRAUMA CASES

Six of the patients in this group suffered from shock due to a combination of trauma and hæmorrhage resulting from explosion of a mortar at Mount Bruno at 2.45 p.m. on July 6, 1944. The patients were admitted from one to two hours after the accident. Five of the six were in severe shock on admission. Two died. It

* From the Medical Services of the Montreal General Hospital.

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CASE 1

P.C., aged 26, admitted July 6, 1944, at 4 p.m., with shrapnel wounds of the right buttock from a mortar explosion at Mount Bruno at 2.45 p.m. Operated on July 6 and 14.

	Time	*Blood*	*Plasma*	*Others*	*Plasma proteins*	*Hæmatocrit*	*Hgb.*
July	6— 5.00 p.m...				4.83	42	86
	—12.00 m.n...	500					
July	7— 4.00 a.m...			1,000 (D.S.)*			
July	8—10.00 a.m...				5.66	43	79
July	10—10.00 a.m...				5.81	42	92
July	25—10.00 a.m...				6.19	40	86

*Dextrose saline. Blood pressure—110/60.

CASE 2

H.A., aged 19, admitted on July 6, 1944, at 4 p.m., with wounds of the buttock and thigh from the Mount Bruno explosion, suffering from hæmorrhage and shock. Operated on July 6, 21 and 25.

	Time	*Blood*	*Plasma*	*Others*	*Plasma proteins*	*Hæmatocrit*	*Hgb.*
July	6— 5.00 p.m...				4.45	42	80
	— 8.00 p.m...		300				
	—12.00 m.n...		300				
July	7— 4.00 a.m...	500		1,000 (D.S.)			
July	7—12.30 p.m...				4.96	28	62
	— 4.00 p.m...	500					
July	8—10.00 p.m...				5.07	22	60
	— 4.00 p.m...	500					
July	9—10.00 a.m...				5.34	27	62
July	10—10.00 a.m...				6.09	33	74
July	11—10.00 a.m...				6.09	35	76
July	12—10.00 a.m...				6.19	35	76
	—10.00 a.m...	500					
July	13—10.00 a.m...				6.56	40	94
July	14—10.00 a.m...				6.29	38	84
July	17—10.00 a.m...				5.89	36	80
July	19—10.00 a.m...				5.92	36	76
July	25— 8.00 a.m...	500					
	—10.00 a.m...				6.36	38	84
July	26—.....	500					

Blood pressure—118/70, stationary. Discharged on August 16, 1944.

CASE 3

L.O., aged 19, admitted July 6, with wounds from Mount Bruno explosion; compound fracture of ribs; hæmoperitoneum; foreign body in right thigh; laceration of intercostal artery; shock. Operated on July 6 and 9.

	Time	*Blood*	*Plasma*	*Others*	*Plasma proteins*	*Hæmatocrit*	*Hgb.*
July	6— 5.00 p.m...		500				
	— 6.15 p.m...				6.02	40	90
	— 8.00 p.m...	1,000		2,000 (D.S.)			
	— 9.30 p.m...				5.75	38	76
July	7— 1.00 a.m...				6.19	41	84
	— 4.30 a.m...				6.32	42	96
	— 9.00 a.m...				6.22	44	90
	— 2.00 p.m...				6.32	44	82
	— 5.00 p.m...				6.43	46	80
	— 8.00 p.m...				6.53	46	98
	—11.00 p.m...				5.92	46	86
July	8— 5.00 a.m...						
July	9— 8.00 a.m...	350		1,000 (D.S.)			
July	13—.....		500	2,000 (D.S.)			

Blood pressure—124/70. Remained stationary.

CASE 4

G.B., aged 25, admitted July 6, with wounds from Mount Bruno explosion; evisceration of intestines; penetrating wound of thigh; laceration of hands; shock. He died the following day.

	Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July	6— 6.30 p.m...				4.25	23	66
	— 8.00 p.m...		1,800				
	—12.00 m.n...	500					

Blood pressure—34/0 — 40/20.

CASE 5

H.D., aged 23, admitted July 6, with wounds from Mount Bruno explosion; penetrating wound left chest wall; compound fracture of right leg; soft tissue wounds of leg; shock. Operated on July 6, exploratory laparotomy, plaster cast applied to leg.

	Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July	6— 5.00 p.m...				5.48	44	90
	6.00— 8.00 p.m...	500	500	200 (D.S.)			
July	7—10.00 a.m...	1,000	500	Cont. Intra. (D.S.)	5.45	46	82
July	8—10.00 a.m...			" " "	5.85	45	86
July	9—.....			1,000 (D.S.)			
July	10—.....			1,000 (D.S.)	5.99	44	90
July	11—.....			1,000 (D.S.)			

Blood pressure—140/90, 130/70, stationary.

CASE 6

B.F., aged 28, admitted on July 6, with wounds from Mount Bruno explosion; perforations of cæcum by shrapnel; severing of deep epigastric artery; lacerations hands; shock; (1,000 c.c. blood in peritoneal cavity). Operated on the same day at 5.30 and 7 p.m. Died the next day.

	Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July	6— 7.45 p.m....				5.37	40	90
	— 7.45 p.m....		500				
	— 8.00 p.m....	1,500		1,000 (D.S.)			
	— 9.00 p.m....		250	1,000 (D.S.)			
	— 9.30 p.m....				5.66	41	98
July	7— 1.00 a.m....	500	250		5.75	42	100
	— 4.30 a.m....				5.78	44	92
	— 9.00 a.m....				5.99	48	92
	— 2.15 p.m....	*Died*					

Blood pressure—(Admission) 150/90. Dropped to 80/60—10.00 p.m., then up to 100/65 at 5.00 a.m. on July 7.

CASE 7

J.C., aged 23, admitted May 10, injured by a train, fracture ribs 7 and 8, right; dislocation of elbow; brush burns; shock; lacerated arms.

	Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
May	10— 3.15 p.m...				5.72	47	100
	— 4.00 p.m...		300	1,000 (D.S.)			
	— 7.00 p.m...				5.58	45	94
May	11— 8.00 a.m...	500		500 (D.S.)	5.24	38	78
May	18—.....				6.22	37	82

Blood pressure constant—120/80.

CASE 8

Mrs. S.S., aged 28, admitted May 31, 1944, injured by a train at 12.45 p.m. Compound fracture leg, lower third; multiple puncture wounds, leg and thigh; fractured pelvis; fracture of neck of radius; fracture of 3rd, 4th, and 5th ribs; contusions lung; shock.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
May 31— 1.00 p.m...		250				
— 4.45 p.m...				6.09	34	72
— 8.00 p.m...	Begun					
— 9.45 p.m...	1,500		1,000 (D.S.)	5.54	31	60
—12.00 m.n...	End					
June 1— 1.30 a.m...				6.05	37	70
— 8.00 a.m...	500		1,000 (D.S.)			
—10.30 a.m...				6.09	38	78
— 4.00 p.m...				6.09	38	78
June 2—.....						
June 3—.....			1,000 (D.S.)			74
June 5— a.m...				5.99	38	78
— 4.00 p.m...	500		1,000 (D.S.)			
June 7— a.m...				7.14	45	92
June 17— a.m...				6.80	44	88

Blood pressure—100/45. Normal.

CASE 9

E.P., aged 54, admitted, walking, on May 27, 1944, with injury received from a logging hook 5 days before. There was an infected laceration of the right arm and axilla, with gas gangrene. He was also suffering from syphilis. Operations on May 27 and June 12.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
May 27—.....			1,000 (D.S.)			
May 28— 2.30 p.m...	1,000			4.83	28	60
— 6.30 p.m...	1,300			5.17	32	64
	300					
May 29— 9.20 p.m...	500			5.66	35	70
	500		1,000 (D.S.)			
— 4.25 p.m...				6.40	40	78
May 30—.....				6.02	41	82
May 31—.....				6.43	42	88
June 3—.....				6.63	41	90
June 16—.....	500		1,000 (D.S.)			

June 28, 1944. Red blood cells, 2,750,000.

CASE 10

C.K., aged 29, admitted May 14, 1944, at 9.30 p.m. with massive hæmorrhage from a jejunal ulcer, and shock.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
May 14—10.30 p.m...				7.62	71	112
—11.00 p.m...		500				
—12.00 m.n...	500					
May 15—10.00 a.m...				7.14	58	115
—11.00 a.m...			1,000 (D.S.)			
— 4.00 p.m...				7.04	55	104
—11.00 p.m...	300		1,000 (D.S.)			
May 16—10.00 a.m...				6.22	53	102

Blood pressure—95/70. Stationary few days.

CASE 11

J.S., aged 45, admitted on July 21, 1944, at 6.40 p.m., with burns from hot metal, both superficial and deep, involving from 85% to 90% of his body. He died the following day.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July 21— 7.00 p.m...		Begun				
— 8.00 p.m...		700	550 (D.S.)	6.56	59	112
—12.00 m.n...					47	106
July 22— 6.40 a.m...		End				

Blood partially hæmolized. First test venous, others capillary blood. Blood pressure not taken.

CASE 12

W.S., aged 22, admitted July 16, 1944, at 9.45 p.m. with 1st and 2nd degree burns of face, arm and legs, involving 32% of surface.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July 16—11.00 p.m...						98
July 17— 1.00 a.m...		600	1,000 (D.S.)			
— 9.00 a.m...						102
— 9.30 a.m...				6.02	49	102
— 4.00 p.m...		300	1,000 (D.S.)			
— 4.30 p.m...				5.69	45	98
July 18—10.00 a.m...				5.95	47	90
July 20—10.00 a.m...				6.29	42	88

Blood pressure not taken.

CASE 13

V.P., aged 31, admitted May 8, 1944, at 9.40 a.m., with burns of face, neck, forearm and hands, 12%, from acetylene torch. He was in shock.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
May 8—10.15 a.m...				6.29	48	92
— 3.15 p.m...				6.25	46	92
— 6.10 p.m...				6.12	48	92
May 9— 2.00 a.m...				6.15	50	94
—10.00 a.m...				6.29	52	94
— 4.00 p.m...		600				
— 6.00 p.m...				6.94	51	102
May 10— 2.00 a.m...				6.73	94	96
May 11—10.00 a.m...				6.66	49	100

Blood pressure constant—120/80.

CASE 14

M.D., aged 51, admitted August 8, 1944, with flash burns received three-quarters of an hour beforehand, from a gas explosion. Head, chest and arms involved, from 32 to 42%. He died the following day.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
Aug. 8—10.00 a.m...		3,200	900 (D.S.)	5.03	50	94
— 1.30 p.m...				5.89	54	102
— 5.00 p.m...	500		900 (D.S.)	6.86	62	114
— 8.45 p.m...				6.86	64	120
—11.45 p.m...	500		1,000 (D.S.)	6.22	56	106
Aug. 9— 4.00 a.m...		2,100	1,900 (D.S.)	5.86	52	96
			1,000 (D.S.)			
— 8.00 a.m...				6.25	49	98
—12.00 noon..				5.21	45	84
— 4.00 p.m...				4.60	52	94

Blood hæmolized. Patient's condition good until 12.00 noon, August 9, went bad 12.30 p.m.

CASE 15

J.M., aged 26, admitted walking, June 19, with flash burns of face and one hand, 7%, received 15 minutes beforehand.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
June 19— 6.30 p.m...				7.21	45	88
—11.30 p.m...				6.76	45	86
June 20—10.00 a.m...				6.46	45	90
June 21—11.30 a.m...				6.94	47	98
June 22—11.30 a.m...				7.42	47	100
June 23—.....						100
June 24—.....						96
June 27—.....						92

No fluids intravenously.

CASE 16

G.B., aged 38, admitted June 19, 1944, walking, with flash burns of hand and face, 5%, received three hours previously.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
June 19— 6.30 p.m...				6.56	46	92
—11.30 p.m...				6.09	49	96
June 20—10.00 a.m...				6.36	45	88
June 22—11.30 a.m...				6.26	49	109
June 23—.....						90
June 24—.....						86
June 27—.....						96

No fluids intravenously.

CASE 17

R.A., aged 29, admitted June 19, 1944, with superficial burns of face, arms and hands, 14%.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
June 19— 6.30 p.m...				6.02	46	98
—11.30 p.m...				6.02	48	98
June 20—10.00 a.m...				6.09	51	100
June 21—10.00 a.m...				6.36	53	108
— 8.00 p.m...		3,000	1,000 (D.S.)			
June 22—11.00 a.m...				6.80	52	106
— 8.00 p.m...			2,000 (D.S.)			
June 23—.....						102
June 24—.....						100
June 27—.....						98

CASE 18

L.A., aged 44, admitted June 19, 1944, at 3.30 p.m., with superficial burns of face, arms and hands, 15%.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
June 19— 6.30 p.m...				6.57	47	90
—11.30 p.m...				5.66	48	100
June 20—10.00 a.m...				5.99	52	106
— 7.00 p.m...		500	1,000 (D.S.)			
June 21—11.45 a.m...				5.89	50	98
June 23—.....						100
June 24—.....						94
June 27—.....						94

CASE 19

R.D., aged 29, admitted July 21, 1944, with severe burns from hot metal, 80%, and in shock. He died the next day.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July 21— 1.00 p.m...				6.76	67	122
— 1.00 p.m...		Begun				
— 4.00 p.m...		1,800			53	130
— 8.40 p.m...		c.c.				114
—12.00 m.n...					55	112
July 22— 4.00 a.m...					49	114
— 6.05 a.m...		End				

Blood partially hæmolized. Blood pressure not taken. First test venous, others capillary blood.

will be observed from the data submitted that the initial values for the hæmatocrit and the hæmoglobin were within normal limits in five of the six cases. The remaining patient had low values. Three showed plasma protein levels below 5 gm. % and one of these was the only patient not clinically in severe shock. It seems clear therefore that in this group at least hypoproteinæmia was not an essential concomitant of shock.

The apparent absence of hæmoconcentration is illustrated well by patient 6 who showed normal values up to a short time before death. Only with the knowledge that this patient's deep epigastric artery had been severed and that at least 1,000 c.c. of blood was found in the peritoneal cavity at operation can one deduce the fact that the apparently normal values really marked a considerable degree of hæmoconcentration. The facts in case 3 are quite

CASE 20

M.B., aged 35, admitted July 21, 1944, with severe burns from hot metal, 85%, and in shock. He died the following day.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
July 21—12.00 noon..				5.95	49	90
—11.30 a.m...		Begun				
— 4.00 p.m...		2,950	1,000 (D.S.)		34	98
— 8.00 p.m...		c.c.			46	98
—12.00 m.n...					45	102
July 22— 4.00 a.m...					44	102
— 8.30 a.m...		End				

Blood partially hæmolized. First test venous, others capillary blood. Blood pressure not taken.

CASE 21

Mrs. J.R., aged 40, admitted January 13, 1945, with superficial and deep burns of arms and hands, 12%, from dress catching fire; burns of two days' standing. Patient in shock.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
Dec. 8, 1944.....		300		5.52	42	80
Dec. 9, "			1,000 (D.S. 5%)			
Dec. 11, "				5.17	46	98
Dec. 18, " *.....			1,000 (N.S.)	5.66	36	74
Dec. 21, "				5.41		56
Dec. 22, "				6.63	30	52
Dec. 23, "	500					
Dec. 29, "				6.46		70

*O.R. Grafting.
December 8, 1944—Red blood cells, 4,000,000; December 21, 1944—red blood cells, 2,880,000; December 22, 1944—Slight hæmolysis blood.

CASE 22

J.P.M., aged 20, admitted December 8, 1944, with caustic soda burns of face, chest and both arms, 28%.

Time	Blood	Plasma	Others	Plasma proteins	Hæmatocrit	Hgb.
Dec. 8— 7.30 p.m....		300 c.c.		6.02	49	100
Dec. 9— 8.30 a.m....		700 c.c.		5.75	56	90
—12.30 p.m....				5.34	52	90
— 9.30 p.m....		400 c.c.		5.66	51	93
Dec. 10—11.30 a.m....				5.58	48	89
— 8.30 p.m....		1,500 c.c.		5.27	46	86
Dec. 11— 9.30 a.m....				5.03	44	84
— 4.30 p.m....		1,250 c.c.		5.41	42	80
Dec. 12— 9.30 a.m....			1,500 (D.S. 5%)	5.31	42	84
Dec. 13— 9.30 a.m....				5.24	41	88
Dec. 14—.....				5.48	38	74
Dec. 20—.....	500		1,000 (D.S. 10%)	6.22	35	72
Dec. 26, 27, 28—.....	1,500					
Dec. 30—.....	500			5.31		58
Jan. 6, 1945.....				6.22		74

December 9, 1944—Red blood cells—3,980,000. December 20, 1944—O.R. skin grafting

CASE 23

Miss I.H., admitted February 9, 1945, with 1st, 2nd and 3rd degree burns of body and limbs 50%, from clothes catching fire.

Time	*Blood*	*Plasma*	*Others*	*Plasma proteins*	*Hæmatocrit*	*Hgb.*
Feb. 9— 8.30 p.m...		2,250 c.c.		5.48	64	118
Feb. 10—12.45 a.m...		4,250 c.c.		5.48	47	100
Feb. 10— 8.00 a.m...				5.31	59	108
Feb. 10—12.00 noon..				5.81	54	112
Feb. 10— 4.00 p.m...				5.81	52	108
Feb. 11—11.00 a.m...				5.66	48	102
Feb. 11— 4.00 p.m...				5.66	46	100
Feb. 12— 9.30 a.m...		500 c.c.		5.31	47	100
Feb. 12— 4.00 p.m...				4.79		97
Feb. 13—10.00 a.m...				4.63	40	84
Feb. 13— 4.00 p.m...				4.39	38	82
Feb. 14— 9.00 a.m...				4.79	35	80
Feb. 15— 9.00 a.m...				5.14	34	74
Feb. 16—.....				5.14	32	66
Feb. 17—.....	500			5.66	30	64
Feb. 19—.....				6.19	34	79
Feb. 18—.....	500					
Feb. 21—.....				5.78	35	76
Feb. 23—.....				5.75	32	72
Feb. 26—.....	500		500 c.c. (D.S.)			
Feb. 27—.....	500		500 c.c. (D.S.)			
Feb. 28—.....				5.11	40	89
Mar. 3—.....				5.48	42	86
Mar. 5—.....				5.41	40	84
Mar. 6—.....	500					
Mar. 9—.....				5.81	44	86
Mar. 14—.....	1,000					
Mar. 15—.....				4.96	43	95

February 9—Blood pressure, 90/60.
February 11—Blood pressure, 124/90.
February 12—Blood pressure, 110/80.
February 13—Blood pressure, 118/65.
February 18—Blood pressure, 110/60.
February 28—Blood pressure, 110/68.
March 2..—Blood pressure, 100/58.
March 13..—Blood pressure, 95/55.

comparable, as are the laboratory results, though this patient survived and the other died.

It is evident that the interpretation of the laboratory data must depend in part upon the knowledge of the nature of the injury especially the degree of blood loss. (See case 10—shock hæmorrhage).

The observations on cases 7 and 8 with multiple injuries from a train accident again demonstrate the absence of hypoproteinæmia and hæmoconcentration, though both were severely shocked.

SUMMARY OF THIRTEEN BURN CASES

By contrast, all of the following 13 burn cases showed evidence of hæmoconcentration either on admission or thereafter. Only two showed hypoproteinæmia at any time in contrast to the cases previously reported. This difference is, we believe, due to the replacement of dextrose saline by undiluted blood plasma as the infusion fluid of choice in the treatment of burns.

It is of interest that all four fatal cases showed hæmoglobinæmia at the time of the first venous puncture. This was not present in any of the cases which survived and may be of prognostic significance. It does not depend entirely upon the extent of the burned area, since the blood of one patient with a 50% burn who survived never showed hæmolysis.

This observation raises the question as to the nature of the hæmolyzing agent and the possible rôle of the hæmoglobinæmia in relation to the renal changes commonly found in fatal burns.

CONCLUSIONS

1. The observations made on this series of patients lend support to the conclusions already submitted as a result of previous studies: that the etiology of shock is complex and its etiological factors unknown. There are probably many predisposing factors such as hypoproteinæmia, hæmoconcentration, blood loss, decreased intramuscular pressure, injury to tissues and pain. Combinations of these, or any one of them, may precede the state of shock but this state may exist in the absence of all of these or conversely many of these may exist simultaneously in a patient without producing shock, as in illustrative cases in this series.

2. With the exception of burns, the hæmatocrit, hæmoglobin and plasma protein determinations on shock-trauma patients may be misleading and should not be relied upon to indicate the state of the peripheral circulation in shock unless they are interpreted in the light of certain knowledge as to the amount of blood loss. In the case of hæmothorax, hæmoperitoneum or large traumatized areas the amount of concealed hæmorrhage may be greatly underestimated.

3. The foregoing conclusions in no way minimize the value of renewed and repeated observations of the plasma protein and hæmatocrit values in controlling therapy in shock trauma or in burns. Taken in conjunction with the facts of the injury they give valuable aid in the management of the patient.

4. Hæmoglobinæmia is a common finding in fatal burn cases. Its etiology and significance in these cases may be of fundamental importance not only as a prognostic sign but as a means of investigating further the nature of the noxious agent liberated as a result of the burn.

REFERENCES

1. MILLS, E. S.: The plasma proteins in shock, *Canad. M. A. J.*, **50**: 24, 1944.
2. MILLS, E. S. AND GORDON, A.: Report to National Research Council, April, 1944.
3. HEUSTELL, H. C. AND GUNTHER, L.: Studies of plasma volume in the human being. Comparative results of reduction of plasma volume, intramuscular pressure and venous pressure in surgical shock, *Am. J. M. Sc.*, **209**: 187, 1945.

RÉSUMÉ

L'étiologie du shock est complexe et il existe encore beaucoup d'inconnues à résoudre. Les facteurs prédisposants tels que l'hypoprotéinémie, l'hémoconcentration, la perte de sang, etc. peuvent se retrouver chez les sujets en état de shock mais aussi chez ceux qui ne présentent pas les symptômes du shock; bien plus, le shock peut exister sans que ces facteurs soient présents. L'hématocrite et l'études des concentrations de l'hémoglobine et des protéines du plasma, qui renseignent bien dans les brûlures, peuvent induire en erreur dans le shock traumatique. Ces renseignements doivent être interprétés après appréciation correcte de la perte de sang. Cette précaution prise, les dosages ultérieurs devront être continués et ils conserveront toute leur valeur pronostique. L'hémoglobinémie, si fréquente dans les brûlures graves est un bon élément de pronostic; cette hémoglobinémie devrait orienter la recherche qui permettrait de déterminer la nature de l'agent nocif ainsi libéré à l'occasion des brûlures. JEAN SAUCIER

Age lends the graces that are sure to please;
Folks want their doctors mouldy, like their cheese.
—O. W. Holmes

SPEEDING UP ACTION OF OXALIC ACID ON THE PROCESS OF WOUND HEALING*

By E. Dubé, L. P. Dugal, Ph.D. and A. Royer

Université de Montréal, Montreal

OUR previous experimental research on wound healing[1] having shown that: (1) oxalic acid hastens the healing of normal non-infected wounds; (2) in combination with sulfathiazole the gain in time averages 20%;[2] we sought a clinical confirmation of those results.

The test was conducted at Ste-Justine Hospital. To safeguard the result against the individual factors of age and health of the patients, we selected cases with two or three wounds, and to further protect the accuracy of the results we used as often as possible symmetrical wounds to ensure an equal blood supply of the fields of experimentation.

Amongst the first cases were some accidental wounds; but since the factors of depth of the wound, degree of bruising and risks of infection vary for each wound, we sought better subjects. Our remaining patients were all skin-grafting cases in which we used donors' areas for the experiments. As these are more uniform in depth, degree of bruising and risk of infection, we feel more justified in the conclusions drawn from them.

TECHNIQUE

The solutions and technique of measurement used were the same as for the laboratory animals. If the wounds were of unequal size, the larger was usually treated with the sulfathiazole-oxalic acid solution. In the three cases of triple wounds we used as second controls, a commercial sulfathiazole emulsion in one, an ordinary greasy dressing in another, and a new solution on which we shall report later in the last one.

The first four cases had daily dressings with measurements every four days. The following cases, however, due to the large size of the wound, could not be subjected to the pain and shock of daily dressings. We modified the technique to a complete dressing every four days to allow us to measure the wound, and on the days in between the top part only of the dressing

* This work was supported by a grant from the Associate Committee of Medical Research, National Research Council, Ottawa.

was removed and the rest flooded with the solutions.

For the last two cases, so as to minimize the shock of the first dressing, we performed the measurement and dressing while the grafting was being done. The good results obtained encourage us to continue that procedure.

Following are copies of the measurements of cases 4, 7 and 8, which show the surface healed in cm.² between each measurement.

RESULTS

The results are given in Table I.

DISCUSSION

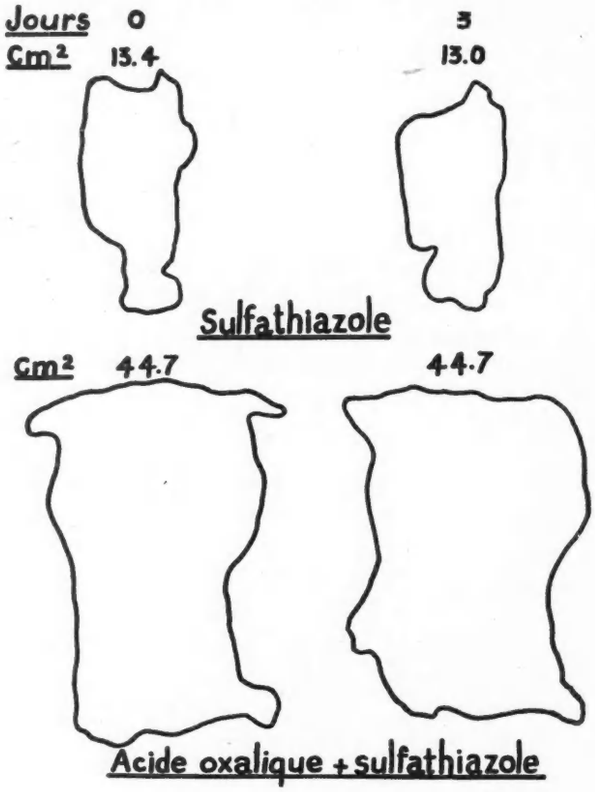
Cases 1, 3, 4, 7, are particularly striking due to the fact that there is a control wound, and the results obtained in these clinical experiments are almost the same as those obtained in our laboratory experiments.

Experiment No. 1: the largest wound (in all these experiments, the wounds were measured with a planimeter according to the technique of duNoüy) treated with sulfathiazole-oxalic acid has healed 4 days before the two control wounds, both of much smaller surface, one of which was treated with sulfathiazole solution alone and the other with a sulfathiazole emulsion.

Experiment No. 3: at the time the experiment was abandoned the sulfathiazole-oxalic acid treated wound was healing almost twice as fast as the wound treated with ordinary greasy dressing.

Experiment No. 4: the experimental wound, treated with oxalic acid, has healed at the same time as the controls, but the surface of the experimental wound was three times as great as the other.

Experiment No. 7: the sulfathiazole-oxalic acid treated wound healed three days before the controls in spite of the fact that it was slightly greater. This case healed remarkably fast due to an optimum state of health maintained through plasma and transfusion.



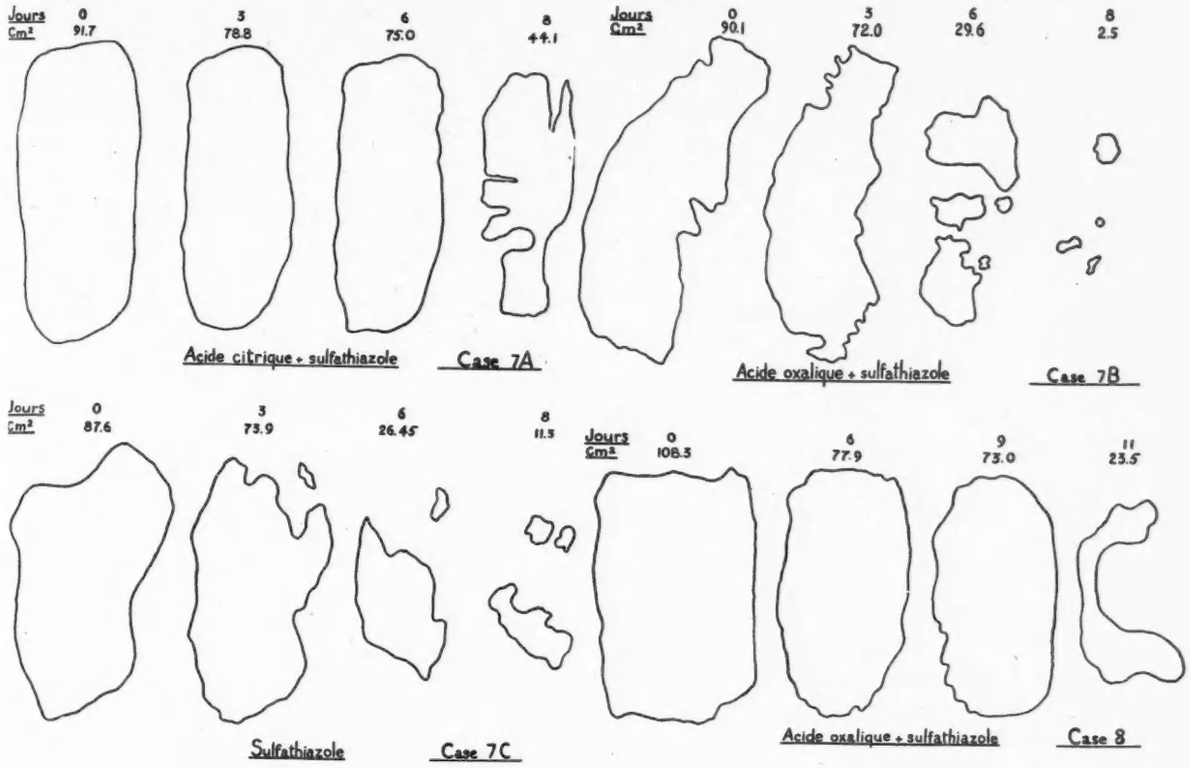
Case 4

TABLE I.

No.	Localization	Treatment	Surface cm.²	Time of healing in days	Average area healed per day in cm.²	Remarks
1	Medius.....	Solution 6	6.3	10	0.63	General health of the patient poor
	Index.....	Solution 5	4.85	14	0.346	
	Ring finger...	Emulsion	2.8	14	0.200	Accidental wound
2	Right thigh...	Solution 6	53.2	13	4 0	Skin grafting case
3	Little finger...	Solution 6	21.8	9.2	1 2	Abandoned on the tenth day due to the bad state of the patient.
	Ring finger...	Solution 5	13.1	*5.75	0 7	
	Medius.....	Greasy dressing	6.2	2.6	0.3	
4	Abdomen.....	Solution 6	44.7	10	4.4	Skin grafting case
	Abdomen.....	Solution 5	13.4	10	1.3	
5	Abdomen.....	Solution 6	85.6	13	7.35	Skin grafting case
6	Left thigh....	Solution 6²	97.2	14	6.94	Skin grafting case, slight infection on the 11th day, took 36 hours to clear up with wet dressings
7	Right thigh					Skin grafting case
	Inside.....	Solution 6²	91.7			Abandoned because of infection
	Top.....	Solution 6	90.1	9	10.0	
	Bottom....	Solution 5	87.6	12	7.3	
8	Left thigh....	Solution 6	108.3	13	8.33	

Solution 6 = Sulfathiazole + oxalic acid. Solution 5 = Sulfathiazole.

*Area on 10th day.



Cases 2, 5, 8.—Although there are no control wounds we can deduce from the results of the other cases that the gain in time of healing shown by the others was maintained in these cases. Those three cases show respective area/day healing of 4.0-7.35-8.33 cm.² which are on the average superior to the results obtained in similar cases with sulfathiazole solution.

Comparison with Laboratory Results

From Table II, we see that although the absolute average gain in days is slightly smaller than for laboratory animals (this is due to case 4 where the difference in surface was too great), the relative average gain corrected for surface/time is even much greater than in the laboratory experiment.

Improvements

For our next cases we are going to try two modifications in the dressings.

1. The use of paresined gauze to prevent any adhesion of the new epidermis to the dressing, with subsequent tearing at the next change and slowing up of the rate of healing.

2. The use of sulfathiazole powder on the wound before applying our solutions, to prevent the infection which the weak solutions used are unable to do.

Conclusion

We have shown by clinical results that the experimental data on the speeding-up effect of weak concentrations of oxalic acid with sulfathiazole on the healing wounds are confirmed in humans.

Table II.

Comparison with Laboratory Results

	Sulfathiazole+oxalic acid			*Sulfathiazole*				
	Average surface	*Average days*	*Surface /day*	*Average surface*	*Average days*	*Surface /day*	*Absolute gain, days*	*Relative gain in surface/days*
Rabbit average....	4.74	17.0	0.28	4.67	21.3	0.22	4.3	21.39%
Human average...	47.0	9.7	4.8	35.3	12.0	2.9	2.3	39.19%

N.B.—All measures in cm.²

N.B.—As an interesting observation, cases 4 and 8 were grafted anew and the donor sites dressed with a commercial emulsion of sulfathiazole. The respective healing times were 14 and 13 days for wounds of 89.4 and 36.5 cm.^{2}, giving an area/day of 6.4 and 2.8 cm.^{2}, respectively.

SUMMARY

Our purpose was to search for clinical confirmation of the results already obtained on laboratory animals with oxalic acid.

Eight experiments are reported on as many subjects. Most of the cases are skin grafting cases in which we used donor areas for the experiments. To safeguard the results against the individual factors of age and health of the patients, we selected cases with two or three wounds on the same individuals.

Our clinical results show that the experimental data on the speeding-up effect of weak concentrations of oxalic acid with sulfathiazole on the healing of wounds are confirmed in humans. The relative gain in surface healed per day, for the rabbit, was 21.39%; for human wounds it is, on the average, 39.19%.

REFERENCES

1. DUGAL, L.-P. ET LAUGIER, H.: *Rev. Canad. Biol.*, 1: 687, 1942.
2. DUGAL, L.-P., LAUGIER, H. ET DESAULNIERS, L.: *Rev. Canad. Biol.*, 2: 509, 1943.

RÉSUMÉ

L'acide oxalique accélère la cicatrisation des plaies. La clinique confirme les expériences déjà pratiquées sur les animaux de laboratoire. La plupart des cas rapportés ont trait à des auto-greffes et les sujets choisis avaient 2 ou 3 blessures. L'acide oxalique dont il est question est une solution à faible concentration combinée au sulfathiazole. Par cette méthode, le gain de cicatrisation moyenne quotidienne des plaies est, chez l'humain, de 39.19%.

JEAN SAUCIER

No men despise physic so much as physicians, because no men so thoroughly understand how little it can perform; they have been tinkering with the human constitution four thousand years, in order to cure about as many disorders; . . . it is true that each disorder has a thousand prescriptions, but not a single remedy.—Charles Caleb Colton.

THE RELATION OF ASCORBIC ACID INTAKE TO GINGIVITIS*

By

Major W. J. Linghorne
Major W. G. McIntosh

Canadian Dental Corps

and

Air-Commodore J. W. Tice
Group-Captain F. F. Tisdall
Wing-Commander J. F. McCreary

Medical Branch R.C.A.F.

and

T. G. H. Drake, M.B.
A. V. Greaves, M.B.
W. M. Johnstone, R.T.

Hospital for Sick Children, Toronto

EXAMINATION of service personnel and apparently healthy young civilians in Canada has revealed that inflammatory changes in gingival tissue are of frequent occurrence. Surveys of 1,448 apparently normal non-selected R.C.A.F. personnel under 30 years of age, including civilians on entry as well as individuals who had been in service for several months, showed that approximately 20% had gingivitis, usually asymptomatic, of a degree which could be readily detected by superficial examination of the oral cavity.[1] In addition, a study of the records of the Canadian Dental Corps in 1941 revealed that approximately 1,800 R.C.A.F. personnel were reporting to dental officers each month with painful, swollen or bleeding gingival tissues. So common are these changes that they should be of concern to both the dental and medical professions.

Gingivitis has been extensively described in the literature but there are a number of opinions concerning its cause. Kruse[2] expressed the belief that certain changes beginning with vascular engorgement of gingival tissue, followed by redness, swelling, sometimes accompanied by destruction of tissue, then thickening and later atrophy, are primary evidences of a lack of ascorbic acid, and that the process may be reversed by the administration of large amounts of ascorbic acid over a prolonged period. Studies[3] previously conducted in the R.C.A.F.

* Reported to the Associate Committee on Aviation Medical Research, National Research Council, February 1, 1944 and March 28, 1945.

demonstrated that the intake of ascorbic acid from the ration available at that time was considerably below the 75 mgm. per day recommended[4] for optimum nutrition. The ration contained approximately 140 mgm. of ascorbic acid in its raw state but destruction in food preparation was such that an average of only 23 mgm. of ascorbic acid was retained in the food served.* This low intake was reflected in a lower than desirable ascorbic acid plasma level. The average fasting plasma level of ascorbic acid among personnel in the R.C.A.F. was slightly below 0.2 mgm. %, contrasted with 0.7 to 1.0 mgm. prevailing when the intake was in the neighbourhood of 75 mgm. per day.

It appeared that the same conditions of ascorbic acid intake applied to civilians as well as to service personnel, as the average ascorbic acid plasma level of recruits within 24 hours of their arrival at a service school was found to be only slightly higher than that of R.C.A.F. personnel who had been in the service for several months. Obviously the recommended intake of 75 mgm. per day was not being achieved by these individuals in civil life.

Accordingly, a study of the relation of gingivitis to the intake of ascorbic acid and other nutrients[5, 6, 7] was instituted in January, 1942. Varying aspects of the problem have been studied during the ensuing three year period and these form the subject matter of this report.

CLINICAL APPEARANCE OF THE GINGIVITIS ENCOUNTERED

Acute and chronic inflammation of the gingivæ of varying extent and degree was encountered in these studies. In this report no attempt is made to fit the various signs into previous classifications. Gingivitis as frequently seen by the authors is described and illustrated by colour photographs. For the purpose of this study the following classification is used.

Essentially normal gum tissue is shown in Fig. 1. The colour is light pink and there is no swelling or thickening. The interdental papillæ are pointed and extend well up between the teeth, the margins are thin, the surface is stippled and the tissues are firm in consistency. The gingival tissue has the appearance of being tightly attached to the teeth.

Changes which have been grouped as grade 1 are illustrated in Figs. 2 and 3. In Fig. 2 slight redness and swelling of an acute nature are evident, chiefly in the papillæ.* Indications of this swelling are the loss of the normal sharp points of the papillæ, their rounded appearance, shininess and apparent lack of attachment to the teeth. In Fig. 3 small areas of redness can be seen at the labial gingival margin at the lateral incisor teeth.

Changes which have been grouped as grade 2 are shown in Fig. 4. The redness and swelling have increased and usually both the papillæ and the rest of the gingival margin are involved. Sometimes the area of redness will stop at a distinct line at a varying distance from the gingival margin, in other cases all the gingival tissue appears to be affected.

A more severe degree of involvement which represents grade 3 is shown in Fig. 5. Here the papillæ have become greatly swollen and reddened. Both the papillæ and the tissues at the gingival margin have become detached from the teeth and there is obvious pocket formation.

Still more severe degrees of involvement than those described as grades 1, 2 and 3 may be encountered. For example a rapidly developing Vincent's infection results in a severe degree of involvement with gum destruction. In our experience it usually occurs in gums that have already exhibited for many months a grade 1, 2 or 3 inflammation.

The above noted changes characteristic of acute inflammation of the gingivæ can be readily differentiated from the gingival changes which occur in scurvy (Fig. 6). The swelling of scurvy is largely due to hæmorrhage and the colour is usually a somewhat darker red.

In addition to the acute changes described above, evidences of chronic inflammation of the gingivæ were frequently seen. In these cases the outstanding clinical manifestation is a thickening of tissue. The thickening may involve the papillæ alone, the rest of the gingival margin, or all the gingival tissues. This condition can usually be differentiated from the acute reddened œdematous swelling previously described, as this thickened tissue is of a firm,

* The messing organization of the R.C.A.F. was changed early in 1942. The ration was changed June 1, 1942. Following this the ascorbic acid content of the food as served in all R.C.A.F. stations averaged 71.1 mgm. per day.

* Although the redness and swelling of the gingival tissues are typical of an acute inflammatory reaction the clinical course of the gingivitis would normally be classified as chronic as the appearance of the gum tissue varies only slightly over a period of weeks. The histological picture reported later in this paper is that of a mild chronic inflammation.

cartilaginous consistency and is pale in colour. Loss of interdental papillæ, usually the result of previous gingival inflammation, was encountered. Loss of papillæ with thickening of the marginal and alveolar tissues is illustrated in Fig. 7.

All these changes have been described by Kruse.[2]

STUDY 1

In March, 1942, a study[1] was begun to determine whether the administration of (1) ascorbic acid alone; (2) niacin alone, or (3) a combination of vitamins A, D, thiamine, riboflavin, nicotinic acid and ascorbic acid would have any effect in improving the gingivitis so frequently seen in R.C.A.F. personnel. Accordingly, 120 male personnel under 30 years of age suffering from grades 1, 2 or 3 gingivitis without complicating factors such as persistent mouth breathing, gross malocclusion, devitalized teeth and partial restorations were chosen. They were divided into four groups and observed over a period of five months. Group 1 received 375 mgm. of ascorbic acid daily (125 mgm. t.i.d.); Group 2 received 225 mgm. of niacin daily (75 mgm. t.i.d.); Group 3 received 45,000 I.U. vitamin A, 1,200 I.U. vitamin D, 9.9 mgm. of thiamine, 9.9 mgm. of riboflavin, 225 mgm. of niacin, and 300 mgm. of ascorbic acid daily in three divided doses. Group 4 received a placebo three times a day. No other treatment was given during the period of study. During the five months' period 27 men were lost from the study and the observations were completed on 93 of the original 120.

Complete medical and dental examinations were made at the beginning of the study and at monthly intervals thereafter. The men all appeared to be in good condition physically and the medical examinations did not reveal any abnormalities. At the time of each examination the gingival tissues were photographed in colour.

From the dental examinations and a study of the monthly photographs it was found that a certain number of the subjects showed improvement, some no change and others an increase in the swelling, redness and other signs of inflammatory reaction. The numbers showing improvement however were no greater in the groups receiving vitamin therapy than in the controls.

STUDY 2

In 1943 a study[1] of 76 R.C.A.F. personnel was undertaken to determine the effect of various levels of ascorbic acid intake on the recurrence of signs of inflammation of the gingivæ among individuals who had received local treatment to remove as far as possible all clinical evidences of gingivitis. Twenty-two individuals who for 6 months were on a diet containing 62 mgm. ascorbic acid and 25 others on the same diet plus 375 mgm. ascorbic acid in tablet form daily showed less evidence of recurrence of inflammation than did a group of 29 individuals on a diet containing 10 mgm. ascorbic acid for the same period. The subjects who received the additional 375 mgm. showed no less evidence of recurrence of inflammation than the subjects receiving only food containing 62 mgm. ascorbic acid.

The results of this study were such as to indicate the desirability of repeating and elaborating the work. Also at this time Dr. B. S. Platt of the Medical Research Council, London, England, suggested including in the projected study a group receiving food containing 25 mgm. ascorbic acid daily, this being approximately the level consumed by the civilian population of Great Britain at that time. Accordingly a third study was begun in April, 1944, and continued for a period of 8 months.

STUDY 3

Procedure.—One hundred and fifty R.C.A.F. personnel, all under 30 years of age, both male and female, were chosen for this study because all had a mild or moderate degree of gingivitis without other complicating factors such as gross malocclusion, persistent mouth breathing, devitalized teeth or partial restorations. They were apparently normal individuals carrying on their regular duties.

After the original oral examinations the subjects were classed as having grade 1 or grade 2 gingivitis and the subjects of the same grades were distributed as evenly as possible among four groups to be described later. At the onset a photograph was taken of the lower anterior gingival region of each subject, using the R.C.A.F. ophthalmic camera with a Kodatron power pack and bulb for illumination.[3] The camera was adapted for the oral photographs by the addition of a precision head-piece which, by means of calibrated rods at each ear, the base of the nose and the top of the incisor teeth,

permitted the head to be placed in an identical position for the original and all succeeding photographs. In addition a small amount of plastic material was placed between the molar teeth and allowed to harden before the first photograph. This mould was numbered and kept on file and was inserted in the same location for each succeeding photograph of that individual, and the positioning of the teeth was thus standardized. The film used was the recently developed Ansco colour film. In order to avoid any possible variations from one batch to another all of the film used came from one batch. Processing of the film was done by the R.C.A.F. photographic division.

The individuals in all groups were then subjected to a local treatment[9, 10] which had been devised by the dental officers associated with this study, to remove as rapidly and completely as possible all evidences of inflammation of the gingival tissues. Briefly, the treatment consists of the use of a displacement pack composed of powder and a liquid mixed together to form a thick paste. The paste is applied so as to fill in the gingival crevices, which are almost invariably present, and, by an outward displacement of the soft tissues, to eliminate each crevice. The pack is retained in place for a period of 48 hours and an additional application made if necessary. The desired result is the complete elimination of all crevices and exposure of sub-gingival calculus after removal of the pack. At the conclusion of the treatment with the pack the calculus is removed and the teeth polished. The patient is instructed to maintain cleanliness and provide for additional stimulation of the gingival tissues by the use of tooth brush and inter-proximal cleansers. The lower anterior gingivæ of all subjects were treated in this manner. The use of inter-proximal cleansers was discontinued however after 6 days. Figs. 9 and 10 illustrate the change produced in the appearance of the gingivæ by the local treatment during a period of 8 to 10 days.

In addition, selection was made of two gingival papillæ as nearly alike as possible on inspection from parts of the mouth other than the lower incisor region and these were recorded. These two areas were also given the standard local treatment, and one week later one papilla was excised and placed in 10% formalin in 95% alcohol and sent to the laboratories of the Hospital for Sick Children for examination. At the conclusion of the study the remaining papilla was excised and treated similarly. A total of 94 cases afforded tissues for comparative histological study before and after dietary control.

Immediately after the local treatment had been completed the results were recorded and a second colour photograph taken of the lower anterior gingivæ. The four groups were then started on their respective diets. Group 1 received food containing approximately 10 mgm. ascorbic acid per day; group 2 food containing 25 mgm.; group 3 food containing 10 mgm. plus 70 mgm. ascorbic acid in tablet form, and group 4 food containing approximately 75 mgm. ascorbic acid.

Many precautions were necessary to ensure the desired ascorbic acid content of the food provided. A separate mess hall, complete with kitchen and staffed by 10 cooks, was set up and a supervising dietitian appointed.* In this mess hall all the subjects in groups 1, 2 and 3 were fed. The subjects in group 4, whose food consisted of the regular station ration, were fed in the station mess hall.

The basic diet served to group 1 contained no citrus fruits or juices, tomatoes or tomato juice, fresh fruits or fresh vegetables and only enough vitamin C containing foods to provide approximately 10 mgm. per day. All canned fruits and vegetables served to this group were assayed for their ascorbic acid content before being included in the diet. No great difficulty was encountered in preparing most foods in such a way that only a minimum of ascorbic acid was retained. The exception to this was potatoes. In potatoes which had undergone months of storage the ascorbic acid content was low (10 mgm. per 100 gm.) and was easily destroyed in cooking. In new potatoes, however, used within a month or two of harvesting, the ascorbic acid content averaged 30 mgm. per 100 gm. and was found to be singularly stable.

Group 2 received the same diet as group 1 plus enough raw cabbage salad to supply an additional 15 mgm. of ascorbic acid. This was a relatively simple procedure since the ascorbic acid content of the available raw cabbage was found to be quite constant at approximately 50 mgm. per 100 gm. Group 3 received the same food as group 1 plus 70 mgm. of ascorbic acid in tablet form each day.

In order to control the ascorbic acid content of the food supplied to the subjects in the four

* Section-Officer D. H. Baxter.

groups samples of all foods as served were collected over a 5-day period at 2 to 3 week intervals throughout the 8 months of the study and were assayed for their free ascorbic acid content. Thus samples were obtained and assays performed on approximately 25% of all food served throughout the study.

The food as served was collected and placed in glass jars containing 3% metaphosphoric acid. These jars were stored in the refrigerator until completion of the 24-hour period ending at noon. They were then shipped by express to the laboratories of the Hospital for Sick Children where the assays were completed on the same evening. The determinations were done by adding an excess of 2:6 dichlorophenol-indophenol and the residual colour measured with the Evelyn photoelectric colorimeter. It was established that no significant loss of ascorbic acid occurred during the storage and transportation of this food.

The food as served was also collected over a 5-day period at approximately monthly intervals and assayed for its content of thiamine, niacin, riboflavin, calcium, phosphorus, iron and total calories.

Clinical evaluations of bleeding and tenderness were made at monthly intervals, the examiners not knowing to which groups the subjects belonged. The tests for bleeding and tenderness consisted of pressure on the gums at the base of the papillæ of the lower incisor teeth with a probe-like instrument having a smooth, blunt end 2 mm. in diameter. The instrument was mounted inside a hollow handle and was so sprung that a pressure of one pound could be repeated at each application. The pressure was exerted at right angles to the surface of the gum tissue. If bleeding occurred the hæmorrhage took place at the neighbouring gingival margin (Fig. 8). In regard to tenderness, the patient was asked whether or not the pressure caused pain. Usually however if the gums were tender the subject would wince and attempt to withdraw his head.

Colour photographs were also repeated at the same time as the clinical examination. At the conclusion of the study the photographs were evaluated for redness and swelling; again the examiners not knowing to which groups the photographs belonged.

Fasting blood plasma ascorbic acid determinations were made on all subjects at the beginning of the study and at approximately monthly intervals thereafter. The blood was obtained by venipuncture, preserved on ice, transported to the laboratories of the Hospital for Sick Children, and the determination completed approximately 12 hours after the specimen was taken. These determinations were also done by the 2:6 dichlorophenol-indophenol method. In addition to the ascorbic acid plasma levels the ascorbic acid in the white blood cells of the subjects immediately prior to the conclusion of the study was determined by O. H. Lowry.

It was not possible to exert a rigid control over the subjects and confine them to quarters throughout the duration of the study. Each subject however was a volunteer and had offered to restrict the foods consumed while off the station to a list of low ascorbic acid-containing foods provided. It is inevitable that some additional foods were eaten during this 8-month period, but the blood plasma ascorbic acid levels provided a check on the care with which the subjects were following the diet. Those whose plasma ascorbic acid levels were either too high or too low as compared with the average of their respective groups were interviewed and an effort made to discover any dietary cause of the discrepancy. If subjects in groups 1 and 2 had plasma levels above 0.4 mgm. % on more than one occasion or an increase above 0.3 mgm. % but below 0.4 mgm. % on more than two occasions, they were discarded from the study. Also subjects in groups 3 and 4 who on more than one occasion had levels below 0.4 mgm. % or on more than two occasions had levels between 0.6 and 0.4 mgm. % were discarded. The cause of these variations from the average might be due to unusual vitamin C metabolism but were more likely due to the subject breaking diet. In either case the individual was considered unsuitable for the study.

In addition to the subjects lost from the study for the aforementioned reasons there were others who were posted away from the station during the course of the study and were unavoidably lost. The original 150 volunteers were divided into 4 groups as follows: Group 1, 38; group 2, 36; group 3, 36, and group 4, 40. Ultimately those who were considered to have faithfully followed the diet and who were observed throughout the entire study numbered 33 in

Colour photographs, with the exception of Fig. 6, by Clinical Photo Section R.C.A.F. and Canadian Dental Corps. Crown copyright.

Fig. 1. — Essentially normal gum tissue—colour light pink, no swelling or thickening, papillæ pointed, extend well up between teeth.

Fig. 2.—Grade 1 gingivitis—slight redness and swelling of papillæ.

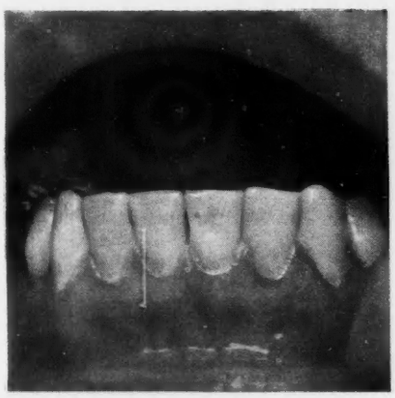


Fig. 3.—Grade 1 gingivitis—small areas of redness at gingival margin, most evident at the bases of the lateral incisors.

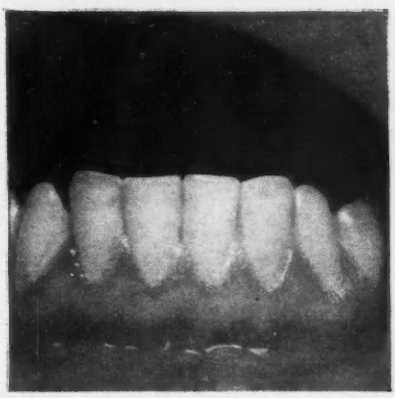


Fig. 4.—Grade 2 gingivitis—redness and swelling more marked. Both papillæ and marginal gingivæ involved.

Fig. 5.—Grade 3 gingivitis—marked redness and swelling of all gingival tissue.

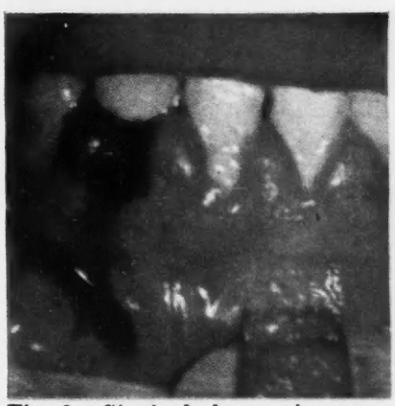


Fig. 6.—Gingival changes in scurvy —gingival swelling largely due hæmorrhage in tissues. Free hæmorrhage from margin of right lateral incisor.

Fig. 7.—Chronic gingival changes—loss of papillæ and recession of gum tissue. Thickening of both marginal and alveolar gingivæ.

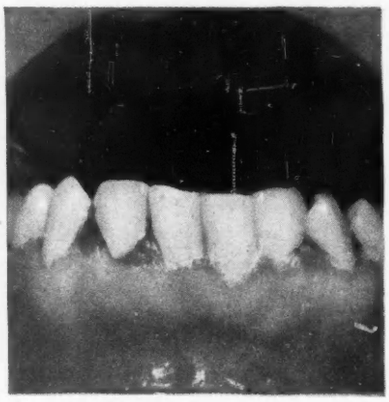


Fig. 8.—Bleeding—bleeding at gingival margin on measured pressure at base of papillæ.

Fig. 9.—Effect of local treatment—grade 2 gingivitis at beginning of study before local treatment. Compare with Fig. 10.

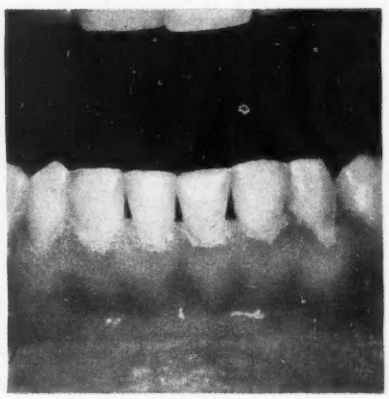


Fig. 10.—Effect of local treatment—same subject as Fig. 9 ten days after institution of local treatment.

Fig. 11. — Gingival deterioration — appearance of gingivæ at beginning of study after completion of local treatment. Compare with Fig. 12.

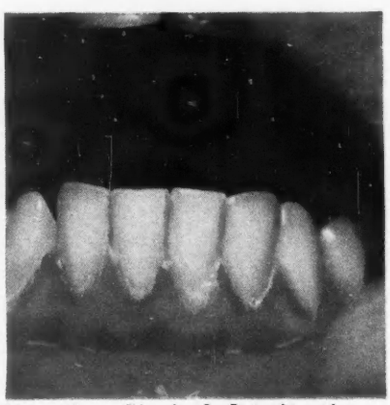


Fig. 12. — Gingival deterioration — same subject as Fig. 11 at conclusion of study. Note increased redness and swelling.

group 1, 30 in group 2, 31 in group 3, and 26 in group 4.

RESULTS

The results of the assays of the diets of the 4 groups for ascorbic acid are shown in Chart 1. It is to be noted that the average daily intake of ascorbic acid of the subjects in group 1 over the 8-months' period was 7.9 mgm., with a considerable increase above this average during the month of September. This is the period previously commented on during which new potatoes were obtained. The average value for group 2 was 22.3 mgm.; group 3, which consisted of subjects receiving the same diet as group 1 plus 70 mgm. of vitamin C in tablet form, showed an average intake of 77.9 mgm.; group 4, who were on the regular station ration, received an average of 78.3 mgm.

The results of the assays of nutritional factors other than ascorbic acid are set out in Table I. As will be noted, the levels of intake of all nutrients with the exception of thiamine are equal to or above the recommended daily allowances.[4] The average intake of thiamine is only slightly below the recommended daily allowance.

In Chart 2 is shown the average fasting blood plasma ascorbic acid concentration in the 4 groups throughout the study.

In Table II, the average concentration of ascorbic acid in the white blood cells of the subjects in the 4 groups at the conclusion of the study is tabulated.

In Table III is set out the photographic record of gingival redness or swelling before local treatment. It is seen from this table that all

TABLE I.

ASSAY OF NUTRITIONAL FACTORS OTHER THAN ASCORBIC ACID IN FOOD AS SERVED,* APRIL TO DECEMBER, 1944

Nutrient	*Groups 1, 2 and 3*	*Group 4*	*Recommended allowances* †
Thiamine	1.3 mgm.	1.4 mgm.	1.8 mgm.
Riboflavin	2.7 mgm.	2.7 mgm.	2.7 mgm.
Niacin	19.4 mgm.	19.8 mgm.	18.0 mgm.
Iron	17.9 mgm.	19.0 mgm.	12.0 mgm.
Calcium	1.5 gm.	1.3 gm.	0.8 gm.
Phosphorus	1.6 gm.	1.6 gm.	
Calories	3,082	2,975	3,000

*Average of food collected over a total of 35 days.

†The recommended dietary allowances of the Food and Nutrition Board, National Research Council, Washington, were revised in 1945 after the conclusion of this study, the Thiamine figure being set at 1.5 mgm., the Riboflavin figure at 2.0 mgm., and the Niacin figure at 15 mgm.

TABLE II.

ASCORBIC ACID CONCENTRATION IN WHITE BLOOD CELLS AT CONCLUSION OF STUDY

Group	*Average mgm. %*
1 (10 mgm. intake)	11.9
2 (25 mgm. intake)	13.2
3 (10 mgm., 70 mgm. synthetic)	25.4
4 (75 mgm. intake)	24.3

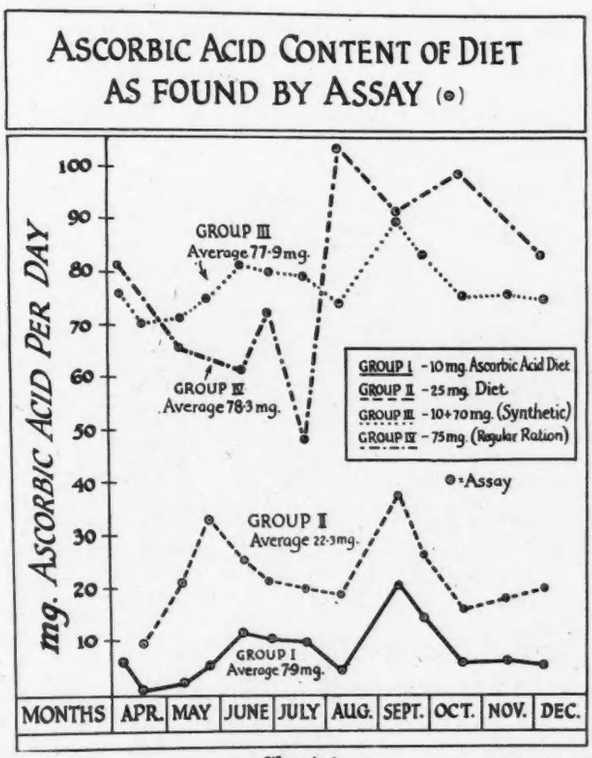


Chart 1

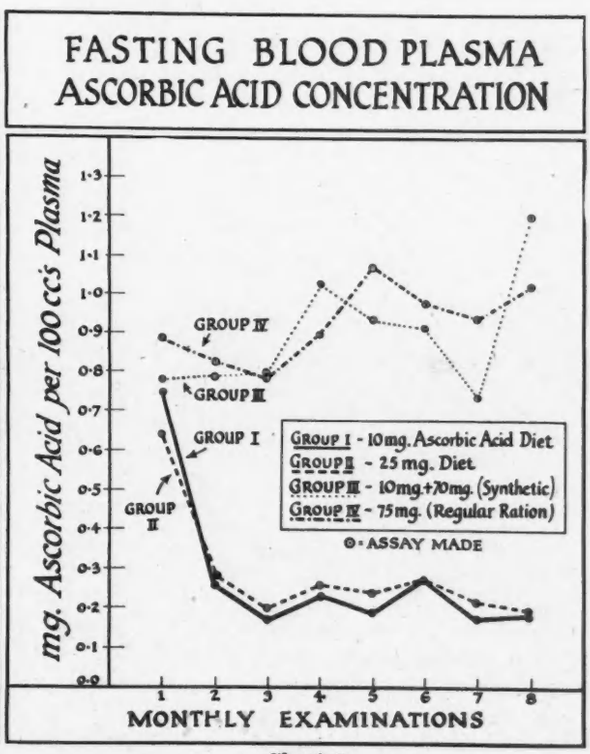


Chart 2

TABLE III.
PHOTOGRAPHIC RECORD OF GINGIVAL REDNESS OR SWELLING BEFORE LOCAL TREATMENT

	Group 1	*Group 2*	*Group 3*	*Group 4*
Grade 0*.....	0	0	0	0
Grade 1.....	27	21	23	27
Grade 2.....	11	15	13	13
Grade 3.....	0	0	0	0
Total examined.	38	36	36	40

*Zero grading indicates no redness or swelling.

patients had evidences of what has been classified as mild or moderate gingivitis, that is, grade 1 or grade 2. The distribution of subjects with the same grade of gingivitis is fairly equal in the 4 groups.

In Table IV is tabulated the photographic record of residual gingival redness or swelling immediately after local treatment of the lower anterior gingivæ. The figures indicate that the residual redness and swelling are distributed approximately equally in all 4 groups. The figures given in this table when compared with those in Table III also indicate that the local treatment employed was quite successful in either removing or reducing to a minimum the obvious evidences of gingivitis in the majority of the subjects (Figs. 9 and 10).

TABLE IV.
PHOTOGRAPHIC RECORD OF RESIDUAL GINGIVAL REDNESS OR SWELLING IMMEDIATELY AFTER LOCAL TREATMENT

	Group 1	*Group 2*	*Group 3*	*Group 4*
Grade 0*.....	23	22	23	24
Grade 1.....	14	14	13	15
Grade 2.....	1	0	0	1
Grade 3.....	0	0	0	0
Total examined.	38	36	36	40

*Zero grading indicates no redness or swelling.

The photographic record of gingival thickening, loss of interdental papillæ or recession immediately after local treatment is set out in Table V. These signs are taken to indicate previous gingival inflammation. It is seen from this table that the four groups are also essentially comparable from this standpoint.

TABLE V.
PHOTOGRAPHIC RECORD OF GINGIVAL THICKENING, LOSS OF INTERDENTAL PAPILLÆ OR RECESSION, IMMEDIATELY AFTER LOCAL TREATMENT

	Group 1	*Group 2*	*Group 3*	*Group 4*
Grade 0*.....	1	0	0	1
Grade 1.....	31	27	31	29
Grade 2.....	6	7	5	10
Grade 3.....	0	2	0	0
Total examined.	38	36	36	40

*Zero grading indicates no thickening, loss of interdental papillæ, or recession.

The incidence of gingival bleeding, tenderness, redness and swelling at the initial examination and the final examination is recorded in Table VI. Further comparisons were made between the four groups in respect to the observed incidence of bleeding, tenderness, redness and swelling. Tables VII, VIII, IX and X, setting out the essential facts are presented in Appendix A.

Figs. 11 and 12 illustrate the changes seen in a subject in whom the gingival condition

TABLE VI.
INCIDENCE OF GINGIVAL BLEEDING, TENDERNESS, REDNESS AND SWELLING AT INITIAL (AFTER LOCAL TREATMENT) AND FINAL EXAMINATIONS

		Group 1		*Group 2*		*Group 3*		*Group 4*	
Symptom	*Examination*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Bleeding.....	Initial....	0	0.0	5	16.7	5	16.1	3	11.5
	Final.....	11	33.3	12	40.0	9	29.0	5	19.2
	Difference..	11	**33.3**	7	**23.3**	4	**12.9**	2	**7.7**
Tenderness...	Initial.....	3	9.1	2	6.7	1	3.2	1	3.8
	Final.....	25	75.8	15	50.0	13	41.9	6	23.0
	Difference..	22	**66.7**	13	**43.3**	12	**38.7**	5	**19.2**
Redness.....	Initial.....	2	6.1	3	10.0	1	3.2	1	3.8
	Final.....	21	63.6	14	46.7	8	25.8	3	11.5
	Difference..	19	**57.5**	11	**36.7**	7	**22.6**	2	**6.7**
Swelling.....	Initial.....	14	42.4	10	33.3	13	41.9	11	42.3
	Final.....	22	66.7	14	46.7	13	41.9	8	30.8
	Difference..	8	**24.3**	4	**13.4**	0	**0.0**	–3	**–11.5**

"regressed" or "deteriorated" during the period of study.

About 4 months after the local treatment a red shiny localized lesion with a slightly gouged-out appearance was noticed on the gingival margins of a number of the subjects. Its position and extent was essentially the same as the reddened area on the gingival margin illustrated in Fig. 3. This lesion was referred to as a "crescentic lesion" and occurred with greater frequency in the subjects in group 1. In the course of 3 to 4 months it lost its characteristic appearance, with extension of the area involved. Box[11] called attention to this lesion in 1924.

As an aid to evaluating the results of the histological study the sections of tissues were placed in three grades according to the amount of ulceration, exudation, hæmorrhage and congestion present. At the end of the study the grades were compared with the grades found at the beginning and the results were then used to attempt to predict the dietetic groups to which the various individuals belonged, which were entirely unknown to the pathologist. No correlation with the dietary groups at all could be established, the results being quite at variance with expectancy.

In general no specific lesion which might be characteristic of lack of ascorbic acid could be recognized in the tissues studied. This was looked for especially in the structure of the blood vessel walls and in the character of the collagenous supportive tissues. Hæmorrhage, when present, appeared to be connected with the changes consequent on inflammation rather than on any specific defect of the vessel wall. The blood vessels were often increased in number in the sub-epithelial layer and dilated, but their endothelial lining appeared normal. Hæmorrhages were frequently seen but these did not suggest anything other than the hæmorrhages commonly seen in the interstitial tissue of an inflammatory area. The collagenous fibrous connective tissue was usually well stained except in areas infiltrated with inflammatory cells, where it was quite obvious that ordinary toxic degenerative changes were in progress, which were shared by all tissue cells in the area. In a great majority of sections the cellular reaction consisted of cells of the lymphocyte series with a variable proportion of plasma cells; included also were a fair number of histiocytes. Only a comparatively few polymorphonuclear cells were seen as a rule, except in those cases in which actual ulceration was in progress.

The picture is thus one of a reaction to a comparatively mild stimulus acting over a long period of time. It is indistinguishable from that of mild chronic inflammation. The smaller percentage of cases in which polymorphonuclear cells were prominent was consistent with an acute or sub-acute inflammation from any cause.

Numerous complaints were received from officers in charge that the men on the low ascorbic acid intake took a longer time on their repair jobs than before the study was started. A number of the subjects themselves complained that they tired easily. For example, one man who was a runner stated he could not get into condition to compete in the track meet. The authors realize the possible psychological effect of the ascorbic acid restriction so are simply noting these observations as a matter of record.

DISCUSSION

Although it was impossible to correlate the histological picture with the dietary groups two useful points seem to be established. First, even when the local treatment removed all clinical signs of inflammation, the histological picture in many cases still showed evidences of a low grade inflammatory process. Secondly, careful study of the blood vessels and collagen failed to reveal a process which could be interpreted as suggestive of a lesion specific for lack of vitamin C.

It is of interest to note the average ascorbic acid blood plasma levels on different intakes of ascorbic acid (Chart 2). It would appear that with an intake approximately 10 mgm. daily, the blood plasma level averages about 0.20 mgm. %. Increasing the intake to nearly 25 mgm. daily does not result in a proportionate rise in the plasma level, the change being only from 0.20 mgm. to about 0.25 mgm. However, with an intake of about 75 mgm. the blood plasma levels range mostly between 0.7 and 1.0 mgm. %.

Similar results were obtained with the concentration of ascorbic acid in the white blood cells (Table II). Very little difference was found in the average levels of subjects receiving 10 mgm. and 25 mgm. of ascorbic acid daily, the level of those receiving approximately 75 mgm. being double. It may also be pointed out that after a low ascorbic acid intake over a period of months a definite relation becomes

established between the ascorbic acid level of the white blood cells and the amount present in the plasma. As the white blood cells are probably representative of the body cells in general, it can be assumed that if the ascorbic acid of the blood plasma is decreased over a period of months to the levels here recorded, the ascorbic acid will also be decreased in the body cells generally. These results bearing on ascorbic acid metabolism are being reported in detail by O. H. Lowry.

From the fact that the average blood plasma ascorbic acid levels were essentially the same whether the ascorbic acid was given largely in synthetic form (group 3) or derived from the food (group 4), it is reasonable to assume that the ascorbic acid administered in tablet form was well absorbed.

The findings recorded in studies 2 and 3 indicate that under controlled conditions the health of the gingival tissue can be affected by the level of ascorbic acid intake. Additional evidence bearing on this appeared in a recent survey in Newfoundland.[12] There among other nutritional deficiencies the ascorbic acid intake probably averaged less than 20 mgm. per day and gingivitis and involvement of other supporting tissues of the teeth was very frequently encountered. It was not uncommon for many people in their early twenties with no remaining teeth to state that they had removed many of their teeth simply by pulling with their fingers. In contrast with this, Platt[13] states that in a study of the dietary habits and physical condition of many hundreds of people in the West Indies, whose diet, inadequate in many respects, contains a large amount of ascorbic acid in fresh fruit and vegetables, gingivitis was almost completely absent.

Considering the different intakes of ascorbic acid it is to be noted that gingivitis recurred most frequently in the group receiving approximately 10 mgm. daily of ascorbic acid derived from the food, next most frequently by the group receiving 25 mgm., then in the group receiving approximately 75 mgm. largely in tablet form, and finally, least frequently in the group receiving 75 mgm. derived from the food. It should also be noted that in study 2 such indications as bleeding, tenderness, redness and swelling were no less apparent when the subjects received food containing 62 mgm. of ascorbic acid with the addition each day of 375 mgm. in tablet form (or a total of 437 mgm. daily) than when the total was only 62 mgm. in the food.

It was recognized that the use of colour photography to check clinical changes was subject to limitations, despite the care taken and the many facilities available to the R.C.A.F. Minor photographic variations occurred which made minimal changes in the tissues difficult to evaluate. This was particularly true in the evaluation of swelling. In contrast with the difficulty in evaluation of any change in swelling and, to a much lesser degree, any change in redness by photography, it was felt that the results for clinical examination of bleeding and tenderness were obtained with a high degree of accuracy.

The experimental results are summarized in Table VI and Tables VII to X in Appendix A. In considering these data, it is important to keep in mind the fact that the four criteria used are arranged in order of reliability as follows: bleeding, tenderness, redness, swelling.

A certain amount of regression occurred in all groups, but the extent of this regression, measured in terms of numbers of cases with signs *or* in terms of increased severity of signs between initial and final examination, varies from group to group and is progressively smaller in order from group 1 to group 4. This orderly progression of percentages alone *suggests* that the observed differences between the experimental groups is unlikely to have arisen merely by chance. Statistical analysis tends to confirm this fact and it is, therefore, reasonable to conclude that the observed differences are real in the sense that they would not be likely to disappear were the experiment repeated under the same set of conditions, though they might be of somewhat different size.

There was a significant increase ($P < 0.05$, *e.g.*, less than 1 chance in 20 that the observed differences are due to chance) in the incidence of bleeding between initial and final examination in groups 1 and 2 only. A significant increase in the incidence of tenderness occurred in all groups (Table VI). There was a very significant increase ($P < 0.01$, *e.g.*, less than 1 chance in 100 that the observed differences are due to chance) in the incidence of redness between initial and final examination in groups 1, 2 and 3 (Table VI). Only group 1, however, showed a significant increase in the incidence of swelling.

On initial examination (after local treatment), the groups were comparable in respect of the proportions with no symptoms or signs (Table VII). On final examination, the proportion of cases with no symptoms or signs are arranged in the order groups 1, 2, 3, 4 (Table VII). Cases in groups 1 and 2 showed a significant amount of regression, only 2 and 3 cases respectively having no bleeding, tenderness, redness or swelling on

final examination. There was no significant change in groups 3 and 4. Further, the differences in the proportions of cases which were symptom-free were very significant ($P < 0.01$) for groups 1 and 4, 2 and 4, 1 and 3, and 2 and 3, but were not significant for groups 3 and 4, and 1 and 2.

The data thus indicate that cases in groups 1 and 2 were not as well maintained as cases in groups 3 and 4. While the observed differences are favourable in direction, the size of the groups is not sufficiently large to permit any statement as to the superiority of the diet of group 2 over that in group 1 or group 4 over group 3 in delaying the recurrence of gingivitis. Indeed the data as they stand *suggest* that group 3 fared as well as group 4, and group 1 as well as group 2.

The extent of the changes (extent and degree of recurrence of symptoms) occurring in the four groups between initial and final examinations is also reflected by the data contained in Tables VIII, IX and X of Appendix A. A very significant amount of regression (in terms of bleeding, tenderness, redness and swelling) occurred among cases in groups 1 and 2 ($P < 0.01$). The changes observed in cases in group 4 were not significant. It is observed that deterioration of gingival tissues was significantly less among the cases in group 4 than among those in either group 1 or group 2. None of the observed differences between groups 3 and 4 were significant and the only difference between groups 1 and 2 and groups 2 and 3 which were significant was that for the incidence of tenderness on all examinations.*

In regard to the treatment of gingivitis the results reported in study 1 would indicate that no clinical improvement is to be expected from the administration of even large amounts of ascorbic acid over a period of 5 months. These findings are in accord with those reported by Stamm, McCrae and Yudkin.[14] Kruse[2] states that the administration of ascorbic acid in large amounts for a year or more will improve conditions of the gingivæ similar to those encountered in these studies. It was not practical in this work to attempt to test this statement.

It is common dental experience to have a recurrence of gingivitis even after thorough local treatment, which would suggest the existence of other etiological factors increasing the susceptibility to inflammation. There is evidence[3] that a considerable percentage of Canadians do not receive for at least 8 months in the year the daily intake of 75 mgm. of ascorbic acid recommended by the National Research Council, Washington. The results here recorded show that gingivitis recurs after local treatment more frequently in individuals receiving a low ascorbic acid intake than in those receiving a high ascorbic acid intake. From this it would appear that it is advisable in the treatment of gingivitis that the local treatment be accompanied by dietetic treatment. Cognizance should be taken of this fact by the dentist in the treatment of his patients and dietary directions given to ensure that they constantly consume a diet adequate in all essential factors including the desired amount of ascorbic acid.

The differences in the results recorded for group 3 who received the bulk of their ascorbic acid in tablet form and group 4 who received the same amount of ascorbic acid derived from food, are not statistically significant. The results recorded, however, suggest that further work should be done to determine whether there is not some additional factor in the food which enhances the action of ascorbic acid in preventing the recurrence of gingivitis.

The surveys performed during these investigations on several thousands of young adults in an economic group probably higher than the average for this nation showed a surprisingly high prevalence of gingivitis. While the condition in its early stages possibly does not cause an appreciable amount of discomfort or impairment of health, this does not hold true as the disease progresses. Destruction of the supporting tissues of the teeth is stated to be the largest single cause for loss of adult teeth.[15] In view of the high prevalence of gingivitis in young Canadians it is obvious that this condition should be of concern from the medical, dental and public health standpoints.

SUMMARY

The results of a series of studies conducted on R.C.A.F. personnel to investigate the effects of various nutrients on the incidence of gingivitis are reported.

Inflammation of the gingivæ was commonly found among the apparently healthy young adults examined.

Study number 1 demonstrated that the administration of large amounts of vitamins A and D, thiamine, riboflavin, nicotinic acid and ascorbic acid for a period of 5 months had no clinical effect on pre-existing inflammation of the gingivæ.

Study number 2 indicated, and study number 3 confirmed that when gingivitis was cleared to a maximum degree by local treatment the provision of approximately 75 mgm. of ascorbic acid daily had a delaying effect on the recurrence of signs of inflammation over that which occurred when 10 mgm. ascorbic acid daily was provided.

* This does not mean that real differences do not exist. Differences in proportion must be of the order of 25% to be significant with groups of this size. In general, groups of 50 to 60 each would be required to make the differences between groups 1 and 2 and between groups 3 and 4 significant at their recorded values.

The results also suggested that a diet containing 75 mgm. of ascorbic acid (group 4) retarded the recurrence of gingivitis to a greater degree than 25 mgm. of ascorbic acid per day (group 2).

There was no significant difference between the effect of a diet containing 10 mgm. of ascorbic acid (group 1) and one containing 25 mgm. of ascorbic acid (group 2).

The retarding effect on recurrence of gingivitis of a diet containing 75 mgm. of ascorbic acid (group 4) was not significantly different from that of a diet containing 10 mgm. of ascorbic acid plus 70 mgm. of ascorbic acid in tablet form (group 3).

The histological appearance of the gingival tissues encountered in these studies in no way resembled the changes seen in scurvy.

The authors desire to express their appreciation of the assistance given in these studies by Squadron-Leader F. H. Harvie, Squadron-Leader H. S. Dunham, Flight-Lieutenant S. A. Hopper, Flight-Lieutenant G. Manace, Major R. L. Twible, and Section-Officer D. H. Baxter.

The authors are also indebted to Wing-Commander A. H. Sellers for statistical analysis of the data and for advice concerning its presentation.

REFERENCES

1. Report C2640, Associate Committee on Aviation Medical Research, National Research Council, Ottawa, February 1, 1944.
2. KRUSE, H. D.: The gingival manifestations of avitaminosis C with especial consideration of the detection of early changes by biomicroscopy, *Milbank Memorial Fund Quart.*, **20**: 290, 1942.
3. Report C2642, Associate Committee on Aviation Medical Research, National Research Council, Ottawa, February 1, 1944.
4. Food and Nutrition Board, National Research Council, Washington. Recommended Dietary Allowances, Reprint and Circular Series No. 115, January, 1943.
5. TOPPING, N. H. AND FRASER, H. F.: Mouth lesions associated with dietary deficiencies in monkeys, *U.S. Pub. Health Rep.*, **54**: 416, 1939.
6. KING, J. D.: Vincent's disease treated with nicotinic acid, *The Lancet*, **2**: 32, 1940.
7. SHAW, J. H., PHILLIPS, P. H. AND ELVEHJEM, C. A.: Acute and chronic ascorbic acid deficiencies in the Rhesus monkey, *J. Nutrition*, **29**: 365, 1945.
8. TISDALL, F. F., MCCREARY, J. F. AND PEARCE, H.: The effect of riboflavin on corneal vascularization and symptoms of eye fatigue in R.C.A.F. personnel, *Canad. M. A. J.*, **49**: 5, 1943.
9. Report C2641, Associate Committee on Aviation Medical Research, National Research Council, Ottawa, February 1, 1944.
10. LINGHORNE, W. J. AND MCINTOSH, W. G.: Diagnosis and treatment of periodontal disease in the services. (In press).
11. BOX, H. K.: Signs of incipient periodontal disease, *Canad. Dent. Res. Foundation Bull.*, 7, 1924.
12. ADAMSON, J. D. *et al.*: Medical survey of Nutrition in Newfoundland, *Canad. M. A. J.*, **52**: 227, 1945.
13. PLATT, B. S.: (Personal communication).
14. STAMM, W. D., MCCRAE, T. F. AND YUDKIN, S.: Incidence of bleeding gums among R.A.F. personnel and the value of ascorbic acid in treatment, *Brit. M. J.*, **2**: 239, 1944.
15. SORRIN, S. S.: Can periodontal disease be cured? *Ontario Dent. J.*, August, 1942.

RÉSUMÉ

Rapport d'une étude très poussée sur les effets des vitamines,—notamment de la vitamine C,—sur la gingivite; cette étude a été poursuivie auprès du personnel de la R.C.A.F. La gingivite a été trouvée très fréquemment chez les jeunes sujets examinés bien que ceux-ci fussent par ailleurs en bonne santé. Dans un groupe soumis pendant 5 mois à un régime polyvitaminé on n'observa aucune modification de l'état gingival antérieur. Dans deux autres groupes soumis à un régime contenant 75 mgm. d'acide ascorbique par jour,—et traités localement par ailleurs pour leur gingivite,—on nota que celle-ci s'améliorait sensiblement et que cette amélioration était plus notable que chez les sujets qui ne reçurent que 10 mgm. par jour d'acide ascorbique. On remarqua encore qu'un régime alimentaire contenant 75 mgm. d'acide ascorbique par jour retarde davantage le retour de la gingivite que l'absorption quotidienne de 25 mgm. Par ailleurs, des régimes contenant 10 mgm. et 25 mgm. d'acide ascorbique ne permirent pas de constater de différences appréciables. Enfin, un régime alimentaire apportant 75 mgm. d'acide ascorbique par jour donna les mêmes bons effets contre la gingivite qu'un régime contenant 10 mgm. d'acide ascorbique, plus 70 mgm. sous la forme de comprimés. Histologiquement, les gingivites étudiées n'ont rien qui rappelle le scorbut.

JEAN SAUCIER

APPENDIX A.

TABLE VII.

SUBJECTS SHOWING NO BLEEDING, TENDERNESS, REDNESS OR SWELLING ON INITIAL EXAMINATION* AND FINAL EXAMINATION

Group	Number of subjects	*No bleeding, tenderness, redness or swelling*				*No signs on both initial and final examination*	
		Initial examination		*Final examination*			
		No.	*%*	*No.*	*%*	*No.*	*%†*
1	33	16	48.5	2	6.1	1	6.3
2	30	14	46.7	3	10.0	2	14.3
3	31	17	54.8	12	38.7	10	58.8
4	26	13	50.0	15	57.7	8	61.5

*After local treatment. †Percentage of those with no signs on initial examination.

TABLE VIII.

SUBJECTS SHOWING MORE REDNESS OR SWELLING ON FINAL EXAMINATION THAN ON INITIAL EXAMINATION*

Group	Number of subjects	More redness		More swelling	
		No.	%	No.	%
1	33	20	60.6	13	39.4
2	30	13	43.3	9	30.0
3	31	8	25.8	6	19.4
4	26	3	11.5	5	19.2

*After local treatment.

TABLE IX.

SUBJECTS SHOWING BLEEDING AND TENDERNESS AT ANY EXAMINATION*

Group	Number of subjects	Bleeding		Tenderness		Neither bleeding nor tenderness	
		No.	%	No.	%	No.	%
1	33	21	63.6	28	84.8	5	15.2
2	30	18	60.0	20	66.7	5	16.7
3	31	13	41.9	17	54.8	10	32.3
4	26	9	34.6	8	30.8	12	46.2

*Excluding initial examination after local treatment.

TABLE X.

INCIDENCE OF BLEEDING AND TENDERNESS ALL EXAMINATIONS*

Group	Number of examinations	Bleeding		Tenderness	
		No.	%	No.	%
1	222	61	27.5	99	44.6
2	199	46	23.1	56	28.1
3	210	44	20.9	40	19.1
4	170	27	15.9	27	15.9

*Excluding initial examination after local treatment.

THE TREATMENT OF DEFECTS OF THE LONG BONES BY CANCELLOUS CHIP BONE GRAFTS

By Lieut.-Colonel T. R. Sarjeant, R.C.A.M.C.

THE problem of complete bone defects caused by shell wounds tests the ingenuity of every surgeon.

If cortical bone grafts are used to restore the full contour of the bone it is difficult to obtain sufficient cortical bone for the larger defects. It is well established that a cortical graft serves only as a bridgework for the growth of new bone. This process has been well named by Mowlem as one of "creeping substitution". In the case of defects this replacement can only occur through the ends of the graft and not simultaneously throughout its whole length as occurs in a graft used for simple non-union. Therefore the time required for the growth of new bone across a defect will be very many months.

For many years large grafts from the ilium have been used successfully in plastic and orthopædic surgery. But it is only within the last five years that it has been demonstrated that there is probably some advantage in using chips or stamps of cancellous bone. A "chip" is cut so that it is about 1 cm. long x 0.5 cm. wide x 0.2 cm. thick. It is claimed that such a piece of cancellous bone is kept alive by the serum in which it is bathed and is readily invaded by capillaries. Hence it does not die and undergo "creeping substitution", for its bone cells survive and the multiple chips inserted become fused into one mass in a much shorter period of time than the substitution of the cortical graft would require. It is also believed that these

grafts tolerate infection better than cortical grafts because they are living grafts right from the beginning.

Mowlem has recently reported a successful series of 70 cases of cancellous chip bone grafts of defects of the facial bones and skull and 5 cases of the long bones. We are now presenting the results of our treatment of 9 cases of defects and 3 cases of delayed union of the long bones. In general, we have followed Mowlem's technique. Our results have been good in some cases and indifferent in others. Cancellous chip bone grafting of the long bones is a rather new field of endeavour, still in the experimental stage. We have had to feel our way without much help and without precedent, and have made mistakes which I will point out.

It must first be appreciated that cancellous bone grafts afford no internal fixation whatsoever, yet complete immobilization of the fragments and the graft is just as necessary as in any other type of graft. The method of immobilization must be carefully considered before operation. Plaster of paris may be sufficient; skeletal fixation with Kirschner wires, Roger Anderson or Stader splints may be necessary; or internal fixation by a sliding cortical graft may be best under the particular circumstances. We have used all of these methods and in two cases of delayed union we have used vitallium screws and a plate. No one method seems to have any advantage over another; the important thing is that immobilization must be obtained and retained.

The cancellous bone is obtained from the ilium, usually by a second team in order to save time. An incision is made below and parallel to the crest of the ilium from just behind the anterior superior spine to just below the posterior superior spine. The outer border of the crest and the upper 2″ of the wing are cleared of muscle. With an osteotome the posterior 4 to 5″ of the crest is cut and retracted upwards like a lid. The outer cortex of the wing below this area is then cut anteriorly and posteriorly and broken outwards. The greatest amount of cancellous bone is to be found in the posterior third of the wing where it begins to curve outwards towards its posterior border. With a sharp osteotome the cancellous bone is then cut out in strips about 1 cm. wide and 2 mm. thick and as long as possible. Smaller pieces will be readily obtained but the thickness should not be more than 2 mm. (less than 1/8″). This bone should be placed in warm normal saline or in moist gauze until used. The outer cortex of the ilium is pressed back into position or discarded if it has become completely detached. The iliac crest is replaced and held in position by No. 1 chromic catgut sutures through its strong aponeurotic attachments, and the gluteal muscles are then sutured to the crest.

At the same time the other team is preparing the fractured bone. The defect is exposed and all scar tissue carefully excised, for it is important that the grafts should be in contact with unscarred muscle, from which they can more quickly derive a blood supply. The bone ends are cut back till freely bleeding bone is reached. This should be done obliquely in order to obtain a larger contact surface for the grafts. The bone ends are then notched for a distance of about 1″ to hold a central strut of cancellous bone against which the smaller chips can be placed. When the bed for the graft is thus prepared, but before the chips are placed in position, the main bone fragments should be properly aligned and the skeletal pin fixation applied, if that has been chosen as the means of immobilization, and if the pins are not already in position having been used to maintain alignment and length before the operation. If plaster of paris alone is relied upon it might be safer in some cases to do the graft through a window in the cast, replacing the window at the end of operation of course. If a sliding bone graft is used for internal fixation, the bone ends should be freshened as described but the notching is unnecessary since the cortical graft will serve as the strut around which the cancellous chips can be placed.

Immobilization having been effected, the cancellous grafts are inserted. The central strut, which should not be more than 2 mm. in thickness, is fitted more or less loosely into the notches. It is not used as a means of internal fixation, but merely a platform on which to build up the graft. The other strips of cancellous bone which were taken from the ilium are cut with an osteotome on a block of wood into the desired chips—1 cm. x 0.5 cm. x 0.2 cm. The full contour of the bone is then built up by simply placing these chips loosely around and about the strut-like flagstones; they should also overlap the bone ends for perhaps a centimetre or as far as the periosteum has been stripped.

Mowlem suggests that the periosteum should not be stripped from the bone ends any farther than is necessary, so as not to jeopardize their blood supply to any degree whatsoever. The closure of the deep fascia and the skin completes the operation.

Postoperatively, the patient complains of considerable pain in the region of the iliac crest for 5 to 7 days but none has had pain after the 10th day and walking has been permitted at the end of 3 weeks if the bone graft has been in the upper extremity.

The bone defects have been grafted at an average time of 2½ months after wounding, the deciding factors being a completely healed wound and the disappearance of œdema. However, one case of a defect of the lower end of the tibia was grafted on the 25th day through an open wound and a delayed suture carried out at the same time. Pus was drained from this case 2 months after operation but the graft was not lost. It is the only case in which infection was present, and will be described in detail later. No infection occurred in any of the other cases, their wounds all being healed at the time of the graft.

The time required for union to occur seems to depend upon the bone grafted and probably upon the length of the graft. Our experience is too limited to permit definite statements. After grafting complete defects, full use of the upper extremity was possible in the case of a metacarpal in 8 weeks, an ulna in 9 weeks and a radius in 10 weeks, but in another ulna only after 18 weeks. In the lower extremity after grafting complete defects of two metatarsals the patient was walking in 12 weeks and in the case of a large but partial defect of the tibia in 13½ weeks. The other 3 cases of defects are not yet out of plaster.

The champions of the cause of cancellous chip grafts claim that "clinical rigidity precedes complete radiographic fusion, so that careful examination and not x-ray is used to determine the point at which fixation can be discarded". We are using fluoroscopic examination also and by the three methods trying to decide when to discontinue immobilization, but we are still rather careful and tend to wait for definite radiological evidence of union.

We have used cancellous grafts in 3 cases of delayed union, one of the femur and 2 of the tibia. Immobilization was discontinued in the femur at 17 weeks, one tibia at 21 weeks and the second tibia is still springy at 16 weeks. But I do not think there is yet a definite place for cancellous grafts in the treatment of delayed union. Firstly, because a sufficiently vascular bed cannot be provided for the chip grafts, and secondly, the sliding, inlay or onlay cortical graft provides the necessary internal fixation as well as an adequate bridgework for the new bone, because here the cortical graft is surrounded by bone on three sides and its replacement occurs throughout its whole length simultaneously.

DELAYED UNION CASES

CASE 1

Accident, June 5. Grafted October 25 (5 months), gutter cut anteriorly 2 1/2" long x 1/3" wide. Chips also packed between bone ends and in areas of deficiency, particularly along the upper fragment which was only about ¾ of its normal thickness. Immobilization discontinued at 17 weeks.

At 23 weeks we are still hesitating to allow weight bearing because fracture line is so apparent.

CASE 2

Accident, compound fracture July 13. Grafted November 23 (4 months). Lower fragment was very osteoporotic and would not have held any type of internally fixing graft, therefore complete reduction was not attempted as this position was felt to be sufficiently good. Sclerosed fragments lying in fibrous capsules were removed, scar tissue cleaned out and the defect filled with cancellous bone chips. Rightly or wrongly this posterior fragment was left for the sake of stability. Immobilization discontinued at 21 weeks. Clinically solid, no œdema, and x-ray shows union progressing well. He is on physiotherapy now and will be allowed to walk soon.

CASE 3

Shell wound (mine), September 17. Fracture of tibia and fibula *also* deep peroneal nerve lesion. Grafted December 28 (3½ months). No callus found. There was some defect antero-medially. Bone ends were freshened. Held by 2 vitallium screws. Four slots cut 3" x ¼", two on medial surface and two on lateral surface and filled with cancellous grafts ⅛" thick. Chips also packed into and around fracture site.

The nerve lesion has undoubtedly been a factor in the healing of this bone both before and after grafting, but it is now recovering.

Those are the three cases of delayed union which were grafted. As will be seen there was some degree of bone defect in all of them and it was for that reason that cancellous grafts were used. We are not advocating the use of cancellous grafts in such cases; they are neither failures nor brilliant successes. We have shown them merely as a matter of interest.

BONE DEFECT CASES

CASE 4

Mine wound, November 21, tibia and fibula. Grafted, 25th day (December 16). This was the one case grafted through the open wound. The wound had been too

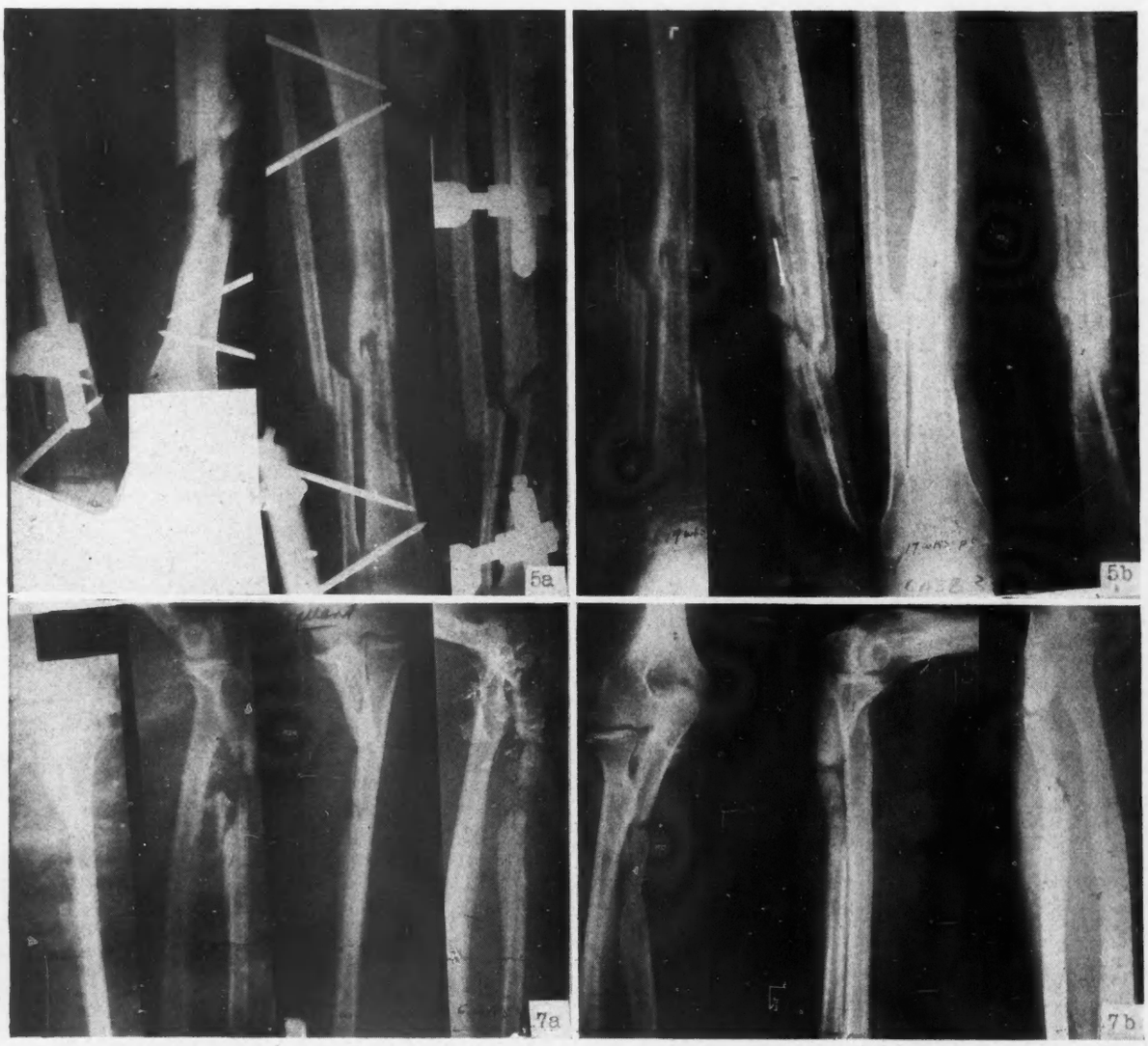
dirty to have an early closure, and, in fact, had had a secondary debridement, and packing of the wound on the 13th day after wounding, at which time pyogenic staphylococci were cultured from the wound. Penicillin intramuscularly and sulfathiazole by mouth were continued and 12 days later (that is, 25th day after wounding) the wound clinically appeared clean. The fracture was in bad position and since this is a notoriously difficult site to maintain reduction it was decided to wire the readily accessible fragments. It was then argued that if it were safe to use internal fixation, it should be safe to fill the large defect with cancellous bone chips, particularly since it is claimed they tolerate infection. Furthermore, they would fill the dead space. This was done and the wound easily sutured. Cultures taken at this time grew Gram-negative bacilli and a few pyogenic staphylococci. Eight weeks later due to pain and swelling a window was cut over the sutured wound and a small amount of pus (containing penicillin sensitive pyogenic staphylococci and coliform) was evacuated. This wound was completely healed 5 weeks later. In the meantime another wound over the medial aspect of the defect had begun to discharge coliform pus. This sinus was curetted 15 weeks after operation and one of the cancellous bone chips removed. It appeared to be alive according to the surgeon who removed it but our pathologist was afraid to risk his microtome on it until it was completely decalcified. A sinus persisted, but with only a serous discharge.

The fracture was clinically solid at the end of 9 weeks and the majority of the cancellous bone had lived; some of the superficial chips had been absorbed. The x-ray report at that time stated that "two slivers of graft medially appear to be absorbing at their upper ends, but in the main graft and fractures are uniting". Immobilization was discontinued at that time, which I think was a little early in view of the presence of infection. However, a cast has been re-applied. At 14 weeks the x-ray report stated: "union fairly complete. Medial part of graft has absorbed and bone edges smoothed off". Absorption of superficial chips underlying skin is prone to occur but infection will also cause absorption.

This case was an acid test of cancellous bone chips for not only was infection present but there was no adequate muscular bed adjacent to the grafts. It is the only case in which infection occurred or rather recurred.

CASE 5

Accident, August 23. Compound fracture of tibia and fibula with much soft tissue damage and loss of bone. When the Roger Anderson pins were inserted 16 days after injury it was impossible to completely restore length because the traction jeopardized the circulation to the foot (Fig. 5a).



Grafted on November 21 (3 months). Narrow bridge of new bone postero-laterally was left undisturbed. Sliding bone graft done; lower fragment very osteoporotic cancellous grafts then packed around graft until the defect was filled. At 4 weeks the Roger Anderson pins were removed. At 8 weeks plaster was removed. Tibia was clinically solid and checked by fluoroscope. Cast was re-applied to knee because of a skin defect (well away from fracture site); this type of cast is more dangerous than no cast on a fracture of the tibia.

At 13½ weeks, after a successful skin graft, walking was allowed and at 18 weeks he could walk 5 miles (Fig. 5b).

CASE 6

Shell wound, October 9, 3rd, 4th, 5th metatarsals. Grafted December 19 (2½ months). Central struts and chips packed around them. At 10 weeks put in a walking plaster. At 12 weeks cast was removed. At 16 weeks grafts are firmly united. Cross union has occurred probably. Walks with a slight limp due to pain along the lateral border of the foot.

CASE 7

Bullet wound, September 29. Ulna. Grafted October 28 (1 month). Fragments notched only ¼ to ½". This was insufficient in the upper fragment and there was no overlapping of the end of the fragment (Fig. 7a). At 15 weeks the radiologist reported non-union between the graft and the upper fragment. At 17 weeks no movement could be seen under the fluoroscope, therefore immobilization was discontinued. At 22 weeks the radiologist said there was little if any union at the upper end (Fig. 7b). At 23 weeks the patient fell on his elbow, producing a contusion over the olecranon but nothing happened to the graft. We feel that there must be union of the proximal lateral chip with the upper fragment and with the central strut.

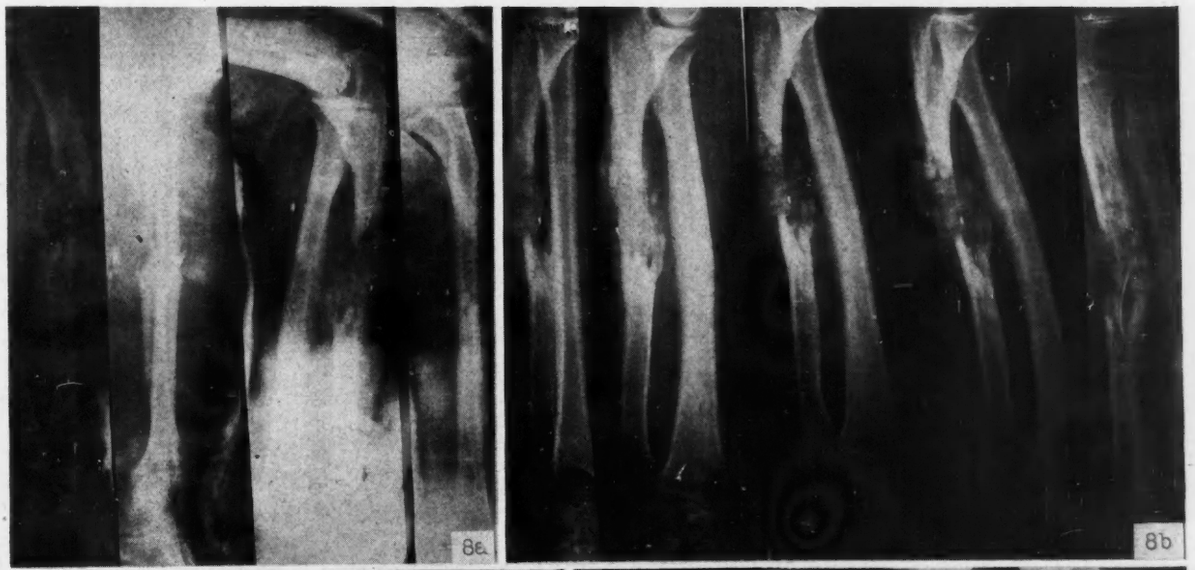
CASE 8

Shell wound of ulna on November 2. Grafted January 17 (2½ months). Both ends were well notched, proximal 1¼", distal ¾". A fusiform mass of chips was built up. Plaster cast used for immobilization (Fig. 8a).

At 8 weeks it was clinically solid, no movement could be seen under the fluoroscope. X-ray showed union to be progressing. At 9 weeks full use of the arm was allowed. At 12 weeks the new bone is much more dense (Fig. 8b).

CASE 9

Mortar wound of radius, November 2. Grafted January 17 (2½ months). Cut back till bleeding bone reached, then notched antero-posteriorly ½" in lower and ⅝" in upper. Chips inserted till normal contour restored, but they did not overlap the bone ends.



At 8 weeks, the cast was removed, the wound had healed by first intention, there was no infection about the Roger Anderson pins, but movement could be seen under the fluoroscope between the graft and proximal fragment.

At 13 weeks there was no improvement, there seemed to be even more absorption of the graft.

I feel the error here was in not using a greater number of grafts and building up a more fusiform mass and overlapping the bone ends. Another point is that the chips were wedged rather tightly into the notch in the proximal fragment. At the time I feared that it was going to be difficult for those chips to become vascularized and that is probably why the graft has been slow at the upper end.

CASE 10

Shell wound of radius August 13. Grafted December 12 (4 months). Notched in transverse plane ¾" in lower and ½" in upper. The radius was reduced as well as possible by traction and a cancellous graft with thin cortex on one side was fitted into the slots. The cortex was included because we were counting on it to help to maintain the reduction. Cancellous chips were placed on both sides of this strut (Fig. 10a).

At 7 weeks it was clinically solid. At 10 weeks immobilization was discontinued and full use of the arm allowed. I do not know whether or not the cortex was a factor in the success of this case. All of the chips lived, as could be seen in the films taken 10 weeks postoperatively (Fig. 10b).

CASE 11

Shell wound of wrist October 9. Grafted February 9 (4 months). Normal length could not be restored by ½". Lower end of ulna preserved for stability and notch cut for the triquetral. Radius cut back and notched on dorsal surface. Cartilage removed from the scaphoid, semilunar, triquetral, capitate and some off hamate. Semilunar and scaphoid and capitate also notched on dorsal surface. Cancellous chips packed in with edges against fibres of pronator quadratus. Roger Anderson pin block in radial shaft and Kirschner wire through metacarpals.

At 9 weeks the radiologist states "bone graft now fused with semilunar and scaphoid; callus of slight density possibly present between graft and radius". It was clinically firm and therefore the Kirschner wire and Roger Anderson pins were removed and a skin tight plaster applied including the upper arm.

We feel that we have reason to hope that this reconstruction and arthrodesis will be solid within the usual 4 months required for an arthrodesis of the wrist. When quite solid, we suggest that the lower end of the ulna should be resected in order to restore rotation.

CASE 12

Gunshot wound of metacarpal, August 27. Grafted January 18 (4½ months). Bone ends were notched ¼". Reduced and held by a Kirschner wire. Cancellous chips inserted and they overlapped the bone ends. At 6 weeks union was progressing. At 8 weeks it was much firmer radiologically and it was clinically solid. The wire was therefore removed and full use of the hand allowed. It is true that the loss of the ring finger is not a serious disability but if the metacarpal can be reconstructed in 8 weeks time it is surely worth while.

CONCLUSION

1. It is felt that cancellous chip bone grafts have a definite place in the treatment of complete defects of the long bones.

2. The filling of large partial defects with cancellous chips is worthwhile when the periosteum is lost over the defect, because they greatly shorten the time required for the reformation of the bone.

3. Probably the ideal time for grafting is about 2 months after injury. This allows time for complete healing of the wound, disappearance of œdema and assessment of the possibility of regeneration of bone from residual periosteum or fragments.

4. The operative procedure is not difficult but care must be taken: (*a*) to provide an adequate, oblique contact surface on the bone ends and overlap them with chips; (*b*) to cut a sufficiently deep notch for the central strut of cancellous bone; (*c*) to not pack the chips in tightly; (*d*) to ensure if possible, that vascular muscle bellies are in contact with the graft.

5. Adequate immobilization must be effected. In the lower extremity it would seem logical to use a sliding or onlay cortical graft along with cancellous chips.

ADENOLYMPHOMA OF THE SALIVARY GLANDS*

By Ross G. D. McNeely, M.D.

Toronto

SALIVARY gland tumours are not of frequent occurrence, but probably the rarest of these is the adenolymphoma, or, as it is sometimes called, papillary cystadenoma lymphomatosum. It was first described by Hildebrandt in 1895, but by 1942 Plaut[1] could collect only 48 cases. To these he added 19 more. Since then the neoplasm has been recorded much more frequently. Oden,[2] Tuta and Apfelbach,[3] and Hines[4] each added one case. The latter collected 17 further cases from foreign publications. Two were described by Joyce, Menne and Zeller.[5] Papers by Lederer and Grayzel,[6] Peck,[7] and Robinson and Harless[8] have each described four cases. Ramage, Binnie and McCall[9] reported bilateral parotid involvement in one patient, which brought the total to at least 103 at the time of writing. Five further cases are described below making the total number reported 108.

INCIDENCE

During the 10-year period between January 1, 1935 and January 1, 1945, surgical specimens from 61,604 patients have been received in the

* From the Departments of Pathology, University of Toronto, and the Toronto General Hospital, Toronto.

pathological laboratories of the Toronto General Hospital. There have been 125 salivary gland tumours. Of these 95 were diagnosed as mixed tumours, 16 as carcinoma, 11 as adenomas, 1 as benign cystic epithelioma, and only 2 as adenolymphomas. Thus in our department the frequency was much less than at the Clinico-Surgical Institute of the University of Buenos Aires, where, according to Nino,[10] this tumour represented 10% of the total number of parotid neoplasms.

CLINICAL FEATURES

Although the tumour has been reported in a child of 2½ years and in a male of 92 years, it almost always becomes apparent in the 5th, 6th or 7th decade. It is five or six times more common in males than in females. The usual complaint is of a small subcutaneous mass present for several months to several years, which has not changed greatly in size although it may have grown slowly larger. Accumulation of fluid in the cystic spaces causes an acceleration in the rate of growth. The tumour is found usually in the region of the parotid gland, rarely along the ramus of the mandible and in the retro-auricular region, and exceptionally in relation to the submaxillary, sublingual and buccal salivary glands. In only three patients in the literature have there been bilateral growths. The tumour is not attached to the skin and is usually movable over the underlying structures. For the most part it overlies the salivary glands and offers no difficulty in removal, but in Case 1 the growth was deep to the parotid gland which demanded careful dissection. The well-formed capsule present about the tumour assists in its removal.

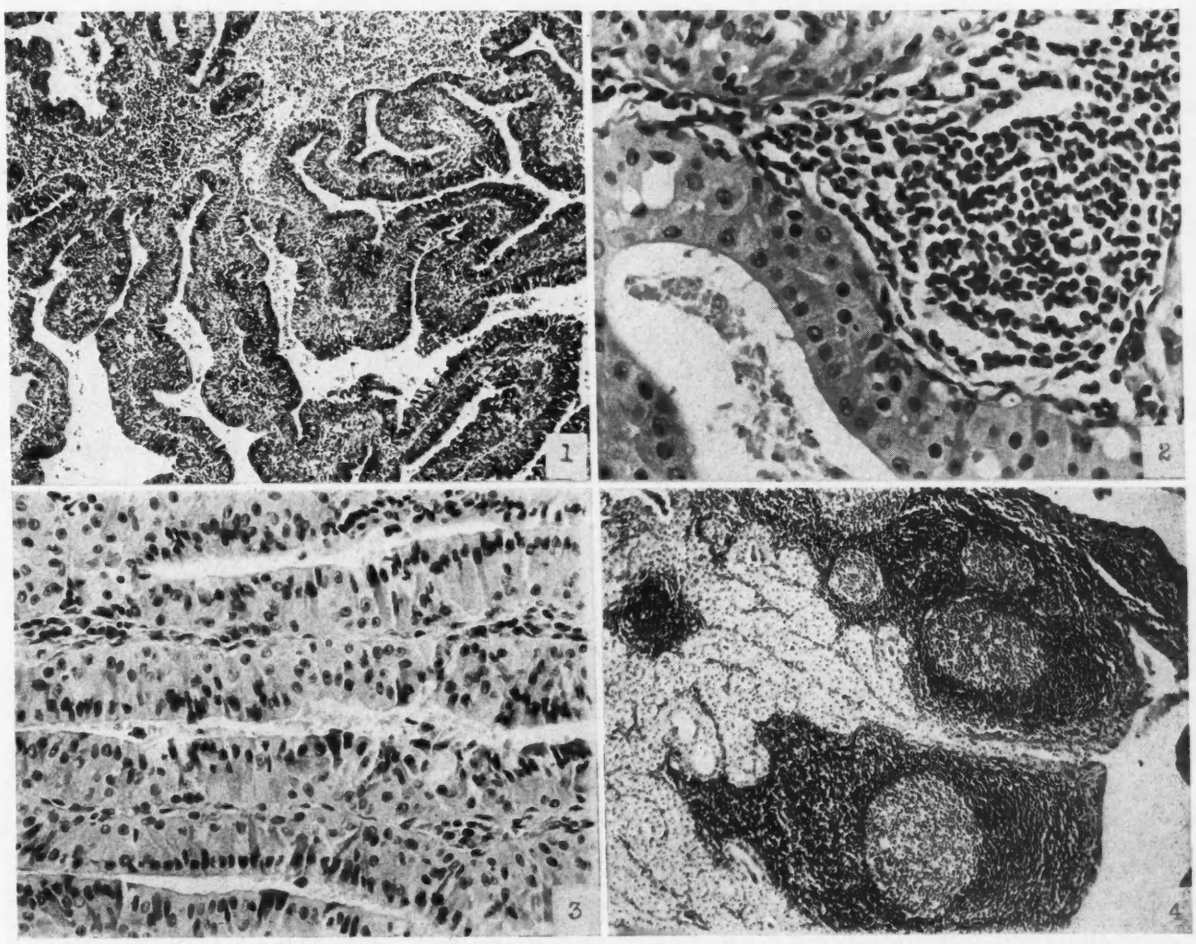


Fig. 1, Case 1.—Showing the papillary and cystic type of adenolymphoma. The papillæ are covered with the typical, doubly-placed cells shown in Fig. 2. The stroma is made up of lymphoid tissue. The cystic spaces were large in this section. x61. **Fig. 2,** Case 1.—Showing the typical doubly-placed epithelial cells lining the alveoli, and covering the papillary projections of the adenolymphoma. x600. **Fig. 3,** Case 3.—Showing columns of epithelial cells forming the tumour. There is practically no stroma present. x328. **Fig. 4,** Case 4.—Showing a glandular structure with alveoli and ducts emptying into a cystic space. The lymphoid stroma supporting the structure contains germinal centres. x61.

CASE 1

A white male, aged 46 was admitted to the hospital service of Dr. R. I. Harris on June 24, 1942, complaining of a painless swelling immediately behind the angle of the lower jaw on the left side of the face. The swelling was first noticed 15 months ago, but in the few weeks before admission it slowly increased in size. Examination revealed a softish rounded mass apparently deep to the parotid gland.

At operation dissection was carried through the parotid gland to a soft encapsulated growth, 2 cm. in diameter, over which the deep fascial veins lay. In removing the tumour it burst, and a quantity of greyish-white, creamy, odourless fluid escaped. The tumour consisted of two irregular pieces of soft granular greyish-white tissue aggregating approximately 2 cm. in diameter.

Microscopically (Fig. 1) the tumour consisted of numerous papillary projections extending into large cystic spaces, and of occasional tubular alveoli lined by a double layer of columnar cells (Fig. 2). The surface cells averaged 10 μ in width and 20 μ in height, with regularly arranged nuclei. The basal cells were smaller, irregular and lay close to the basement membrane. The cytoplasm stained with moderate intensity and contained innumerable acidophilic granules. The nuclei stained lightly basophilic and were ovoid in shape. They had a thin nuclear membrane, a fine intranuclear network, and usually one large nucleolus. The stroma supporting the papillary projections and about the tubular alveoli consisted of a delicate reticulum infiltrated by many lymphocytes with the formation of well-developed germinal centres. Lying in the cystic spaces were lymphocytes, desquamated epithelium and a granular albuminous-like material.

CASE 2

A 59-year old male was admitted to hospital November 3, 1943, under the care of Dr. Gordon Murray, complaining of a swelling in the left cheek of twenty years' duration. It was not painful, but during the past year it had been increasing slowly in size. A mass 2.5 x 2.5 x 1.5 cm. was found partially embedded in the central aspect of the external surface of the parotid gland. The cut surfaces were diffuse, slightly granular and glistening.

The tumour was made up of groups of tubular alveoli and tiny cysts, surrounded by a diffuse reticulum supporting many round cells, with the formation of numerous lymph follicles having definite germinal centres. The alveoli and cysts were lined by a double row of columnar cells identical with those described in Case 1. The lumina were filled with a pink-staining amorphous granular material in which were many round cells. The whole was encapsulated by loosely arranged strands of connective tissue.

CASE 3

An 84-year old male was admitted to hospital November 28, 1935, under the care of Dr. W. E. Gallie, suffering from a fractured humerus. On examination a large mass was found over the angle of the left mandible, extending upwards towards the malar bone and downwards into the neck. It was firm but not hard. It did not transilluminate. The lower pole was slightly tender. The overlying skin was freely movable, but the mass appeared to be fixed to the underlying structures. The patient died on the third day of hospitalization.

At autopsy, over the left angle of the jaw an egg-shaped mass was found measuring 8.5 x 6 x 5 cm. This extended as high as the zygoma and 4 cm. below the lower margin of the mandible and was fixed to the underlying structures. The cut surface was lobulated, the interstices containing a thick fluid.

The tumour was made up of double-rowed eosinophilic epithelial cells similar to those described in Case 1. These cells covered closely approximated papillary formations which had very little central stroma (Fig. 3). Thus the papillæ for the most part were composed of two rows of doubly placed cells whose basement membranes were in apposition except for fine strands of fibrous tissue and delicate capillaries containing red blood cells. Here and there however, the columns were separated one from the other by collections of lymphoid tissue. The interstices between the columns were extremely narrow and contained a pink staining fluid material.

CASE 4

This case is reported through the courtesy of Dr. M. C. Dinberg, Toronto. The patient, a white male aged 56 years, had noticed for three years a slowly growing mass behind the ascending ramus of the left jaw. A growth measuring 5 x 4 x 2.7 cm. was removed. This on section had a grey, lobulated surface.

Histologically the tumour was made up of large, eosinophilic columnar cells similar to those described in Case 1, and arranged in masses and cyst-like structures filled with a pink-staining, granular material in which were lymphocytes and also numerous clefts suggesting the presence of cholesterol. Between the masses of cells and the groups of alveoli were collections of round cells supported by a fine reticulum. Active germinal centres were present (Fig. 4). In other areas a more papillary

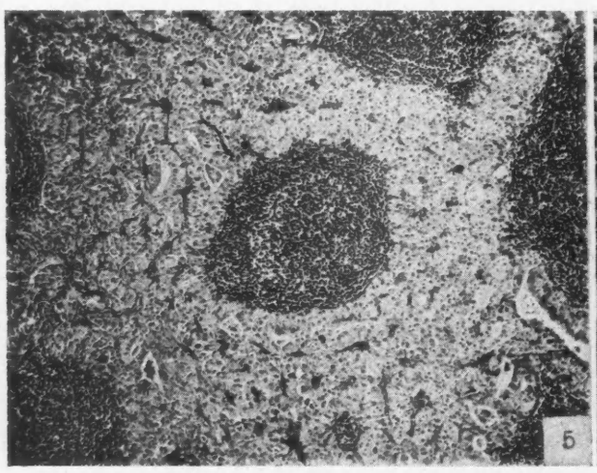


Fig. 5, Case 5.—Showing the more solid type of adenolymphoma. The growth is composed of closely-approximated, tubular alveoli and a lymphoid stroma forming germinal centres. There is no true cyst formation. x67. **Fig. 6.**—From a salivary adenoma showing an interlobular duct. The epithelial cells lining the duct have the same doubly placed arrangement as the adenolymphoma. The duct is surrounded by a lymphoid stroma. x165.

arrangement was noted. The projections were made up of reticular and lymphocytic stroma covered by double rows of the same characteristic pink-staining cells.

CASE 5

This case is reported through the courtesy of Dr. C. B. Waite and Dr. Roger Chenoweth, of Peterborough, Ontario.

An 82-year old male had complained for three years of a slowly enlarging mass situated beneath the skin in the right parotid region. This finally caused severe facial neuralgia from which he sought relief. An encapsulated soft tumour measuring 3 x 2.5 x 2 cm. in size was removed. The cut surface was somewhat granular and homogeneous. There were no cysts visible.

The neoplasm had an alveolar and tubular arrangement composed of double rows of columnar epithelial cells. The alveoli and tubules were closely approximated and contained amorphous granular pink-staining material. Between the alveoli were capillaries, fine fibrous tissue and very occasional round cells. Here and there certain alveoli were distended and took on an almost cystic appearance. Rarely lining cells projected into these alveoli, but there was no definite papillary arrangement. Scattered throughout the section were discrete collections of lymphoid tissue with active germinal centres (Fig. 5).

Gross examination.—The tumour is flattened and lobulated, varying in size from 2 to 8.5 cm. in the largest diameter with a well-defined, thin, fibrous capsule. Depending on the histological make-up the tumour varies in consistency and in appearance. Thus it may be firm, soft, or partly or wholly cystic. On section, as in Cases 2 and 5, the tumour may be almost solid or, as in Case 1, almost entirely cystic. The solid tissue varies in colour from grey to reddish brown. The cystic spaces contain a fluid material which may be thin and serous or mucoid.

Histology.—There is considerable variation in structure between individual tumours of this type. This is due only to the differences in the arrangement of the two histological constituents composing it, the epithelial elements and the stroma. The epithelial cells are arranged in a double-rowed manner which is characteristic (Fig. 2). The surface cells average approximately 10 μ in width and 20 μ in height. The cytoplasm stains with moderate intensity due to the presence of brightly acidophilic granules within it. The nuclei are regularly arranged, ovoid in shape and stain lightly basophilic. They have a thin nuclear membrane, a fine intranuclear network and usually one nucleolus. The basal cells are very similar to the surface cells but are smaller, vary somewhat in size, and lie close to the basement membrane. The nuclei are irregularly arranged. The stroma about the epithelial elements consists of delicate reticulum supporting lymphocytes and occasional plasma cells. Active germinal follicles are frequent where the lymphoid tissue is abundant. From these elements the tumour is formed. The growth may be largely cystic, the cysts lined with the characteristic doubly-placed epithelial cells, lymphoid tissue serving merely to separate the cysts. Into the cysts may project papillary processes made up of lymphoid tissue and covered by the characteristic cells. Certain specimens may be almost entirely papillary in arrangement. Where the tumour is solid and diffuse, small alveoli will be found. The supporting lymphoid tissue may be considerable (Fig. 5), or slight in amount (Fig. 3). The capsule which separates the growth from the surrounding areas is composed of fine fibrous tissue.

GENESIS

Many hypotheses have been offered as to the origin of this tumour. These are briefly reviewed in the following paragraphs.

1. Branchiogenic origin. This view was based on the embryonal type of epithelium and on the presence of lymphoid stroma.

2. Heterotopic rests of ectodermal cells of the Eustachian tube.

3. Misplaced thymic anlage.

4. Ectopic tonsillar ectoderm of the 3rd or 4th branchial pouch.

5. Metaplasia of endothelium of lymph vessels.

6. Orbital inclusion body. This is a tubular structure found in the region of the parotid gland in the embryo of certain members of the carnivora. As the parotid gland grows it finally lies in close contact with this structure. It is, however, unknown in man.

7. Heterotopic salivary gland rests in lymphoid tissue.

8. Lymphoid embryonic rests in salivary glands.

9. Oncocyte origin. The oncocyte or pyknocyte is a type of cell which apparently is derived in later life from both the glandular and duct epithelium of the salivary gland. These cells are considered to form this tumour, called by some the oncocytoma, when they proliferate in heterotopic salivary gland rests in lymphoid tissue.

10. Failure of remnants of undifferentiated salivary gland tissue to fuse with the ductile system.

COMMENT

The adenolymphoma is a well-defined pathological entity with a characteristic clinical, gross and histological picture. Two cases only of a

malignant type have been reported. Many hypotheses as to the source of this tumour have been proposed. It would seem reasonable that if a tumour is derived from elements of a structure it should be found in association with that structure. Should the tumour be derived from thymic tissue, from the Eustachian tube, from the branchiogenic system or from lymph vessels, then the tumour should be found in association with these structures in their normal situation in the body. Instead, the adenolymphoma is found in association with salivary glands or in areas where salivary gland tissue may be found. If the oncocyte is the precursor one would expect to encounter the growth exclusively in the older age group. Such is not the case.

In considering the histogenesis of a tumour, one must take into account its architecture and the elements which make it up. The first histological impression of the adenolymphoma suggests that it has no definite arrangement, that it is made up only of cysts and alveoli lying in lymphoid tissue. With more careful study the tumour appears to have a definite glandular pattern which is shown in Fig. 4 in which can be identified alveoli, and secondary and primary ducts. This in itself suggests that the adenolymphoma must be derived from cells of a glandular structure. Study of a number of normal salivary glands and salivary adenomas have shown interlobular ducts lined by cells which appear to be identical with the epithelial elements of the adenolymphoma. Certain of these ducts can even be occasionally found lined by these cells in double-rowed arrangement. This is well shown in Fig. 6, from an adenoma of a submaxillary gland in a man aged 56, and confirms the view of Carmichael, Davie and Stewart.[11]

Reference again to Fig. 4 makes it apparent that the lymphoid tissue serves as a supporting stroma for the epithelial elements, and apparently takes part in the abnormal growth process. In order to explain the presence of the lymphoid tissue it is not necessary to postulate that the growth occurs only in lymph nodes or that this lymphoid tissue is misplaced, for about ducts of normal salivary glands small amounts of lymphoid tissue may be found. In certain salivary adenomas the lymphoid tissue apparently becomes hyperplastic with the hyperplasia of the glandular tissue. This can be seen by reference again to Fig. 6.

In conclusion, the most logical explanation as to the origin of the adenolymphoma would seem to be that it is derived from one of the interlobular ducts of the salivary gland. This is suggested both by the similarity of the epithelial cells and by the glandular pattern of the tumour. An anomaly of tissue blending as described by Nicholson[12] may be responsible for the lymphoid component, but it well may be that the lymphoid tissue occasionally found about the interlobular ducts is the source of the lymphoid tissue of the adenolymphoma and at times of salivary adenomas.

SUMMARY

Five new cases of the tumour, adenolymphoma of the salivary glands (in each instance the parotid gland), are reported. This benign growth represents slightly more than 1.5% of all salivary gland tumours removed surgically at the Toronto General Hospital in the past 10 years.

The adenolymphoma as a rule becomes apparent as a slowly growing mass near the angle of the lower jaw usually in males in the 5th or 6th decade. Subjective symptoms are absent or slight. The growth is encapsulated and easily removed.

The tumour is composed of tall, doubly-placed, acidophilic, columnar epithelial cells which line ducts and gland-like arrangements into which may project papillæ and which may be dilated to form cystic spaces. The epithelial structures are supported by a lymphoid stroma with active germinal centres. When the arrangement is largely cystic, the tumour grossly is fluctuant. When the arrangement is more alveolar it is firm in consistency.

That the epithelial elements of the tumour are derived from salivary duct epithelium is the most acceptable histogenetic hypothesis. The lymphoid tissue which appears to participate in the neoplastic process is probably derived from lymphoid tissue found occasionally about the ducts of the normal salivary gland.

REFERENCES

1. PLAUT, J. A.: Adenolymphoma of parotid gland, *Ann. Surg.*, **116**: 43, 1942.
2. ODEN, D.: Papillary cystadenoma lymphomatosum of parotid gland, *Am. J. Surg.*, **30**: 57, 1935.
3. TUTA, J. A. AND APFELBACH, G. L.: Papillary adenocystoma lymphomatosum of neck, *Am. J. Surg.*, **56**: 504, 1942.
4. HINES, R. E.: Papillary cystadenoma lymphomatosum, *M. Bull. Vet. Admin.*, **18**: 210, 1941.
5. JOYCE, T. M., MENNE, F. R. AND ZELLER, W. E.: Some unusual tumours of cervical region, *Arch. Surg.*, **42**: 338, 1941.
6. LEDERER, M. AND GRAYZEL, D. M.: Papillary cystadenoma lymphomatosum, *Arch. Path.*, **34**: 833, 1942.
7. PECK, H.: Papillary lymphoid cystadenoma; report of four cases, *J. Lab. & Clin. Med.*, **28**: 299, 1942.

8. ROBINSON, D. W. AND HARLESS, M.: Papillary cystadenoma lymphomatosum of parotid gland, *Surg., Gyn. & Obst.*, 76: 449, 1943.
9. RAMAGE, J. S., BINNIE, G. G. AND MCCALL, A. J.: Bilateral adenolymphoma of parotid glands, *Brit. J. Surg.*, 31: 189, 1943.
10. NINO, F. L.: Cistoadenolinfomas papiliferos del cuello, *Bol. Inst. de Clin. quir., Univ. de Buenos Aires*, 16: 271, 1940. Also: *Int. Abst. Surg.*, 72: 115, 1941.
11. CARMICHAEL, R., DAVIE, T. B. AND STEWART, M. J.: Adenolymphoma of salivary glands, *J. Path. & Bact.*, 40: 601, 1935.
12. NICHOLSON, G. W.: Studies on tumour formation; tissue malformations; anomalies of position and of blending, *Guy's Hosp. Rep.*, 72: 333, 1922.

THE HEART IN HYPERTENSION SINCE THE DAYS OF RICHARD BRIGHT*

By Paul D. White, M.D.

Boston, Mass.

[INTRODUCTION TO DR. WHITE'S ADDRESS BY DR. HAROLD N. SEGALL, OF MONTREAL

This evening, the eighth Louis Gross Memorial Lecture, will be delivered by Dr. Paul Dudley White. Dr. Paul White was born and educated in Boston. He has made the Massachusetts General Hospital and Harvard Medical School his headquarters during the course of his distinguished career. To this extent, he belongs to Boston, but in the wider sense, he belongs to the world. A rich, natural endowment of sympathy with individual men and women and with humanity in general finds expression in Dr. Paul White's activities as a world citizen and as a physician. Daily he is actively engaged in the prevention, the treatment and the relief of suffering in human individuals. His own clinical researches and those that he developed with his students and collaborators have been and are enhancing the progress of clinical science. At present, Dr. White has a large staff of students and assistants who are engaged in correlating clinical observations, so as to bring forth new truths. Throughout the entire world, wherever there is a physician who requires aid in the study of diseases of the heart for the understanding of the patients who consult him from day to day, Dr. Paul White's book is in active use. I doubt if a book on this subject has ever enjoyed such wide usefulness as the Paul White book. Moreover, it is not just a book; in using it we say "Let's see what Paul White thinks about this".

In a very real sense, our guest speaker makes his influence for good felt in every corner of the globe. He was one of the founders of the American Heart Association, a body dedicated to the prevention and relief of cardiovascular disease and he played a large rôle in developing the *American Heart Journal*. A lively interest in all domains of life where good can be achieved for the sake of humanity finds Dr. Paul White prominently on the world's scene. By precept and example as a teacher of many generations of undergraduates and graduate students he has spread his influence far and wide in all lands of the world. When Louis Gross decided to study clinical cardiology, he had a wide choice in selecting his teacher; he chose to go to Paul White in the summer of 1937.

In a poem dedicated to the teachers of his School, Rudyard Kipling wrote:

"For they taught us common sense
Tried to teach us common sense
Truth and God's own common sense
Which is more than knowledge."

As one of Dr. White's pupils who has cherished his friendship since our first association in 1923, I think these lines peculiarly appropriate to him.

This evening, we count it as a great honour that he has accepted the invitation to deliver the Louis Gross Memorial Lecture.]

IN 1827 there appeared the following case record on pages 22 and 23 of the *Reports of Medical Cases Selected with a View of Illustrating the Symptoms and Cure of Diseases by a Reference to Morbid Anatomy*[1] by Richard Bright, M.D., F.R.S., Lecturer on the Practice of Medicine, and one of the physicians to Guy's Hospital, London. This patient was evidently one of the very first instances on record of hypertensive heart disease with chronic nephritis and extensive heart failure, starting with dyspnœa and going on to anasarca.

"Case VIII. William Bonham, aet 55, a large man of florid complexion, living as a carter in the service of a cheesemonger, was admitted to Guy's Hospital, December 13th. A married man, habitually taking a good deal of spirits, stated to have enjoyed till within two or three years a good state of health, except that about eleven years ago he suffered from severe inflammation of the chest. For the last two or three years he has experienced occasional pain in his back and loins, and has been subject to complaints which he has considered gravel, passing his water frequently and in rather deficient quantities. For nearly a year he has been much out of health from an attack of gout, and great shortness of breath. About two months ago, after much exposure to cold and wet, his legs first began to swell. At the time of his admission his legs and thighs and scrotum were most enormously swollen. Anasarca extended over his whole body, both the abdomen and the back; his left hand was also puffed up by the effusion into the cellular membrane.

"15th. Urine of a deep yellow colour, clear, and *coagulating in a very marked manner by heat*, assuming a white curdled form.

"He derived great relief from the means employed, for a day or two, but then his cough increased; he was obliged to be raised very much in bed; his urine became more scanty, but was quite clear. He sunk and died on the sixth day after his admission.

SECTIO CADAVERIS

"The lungs adhered almost universally; and in those parts of the cavity where this was not the case, serum had collected. The lungs themselves were œdematous in a high degree. The heart remarkably enlarged; on the left side it was very thick and strong; on the anterior surface was one of those opake (*sic*), white, superficial patches which are frequently observed; the valves all perfectly healthy. The liver was rather hard and solid, but not diseased in structure. The spleen was soft; pancreas and intestines healthy. The bladder contained a few drams of urine. The kidneys were very small, and hard in consistence, feeling almost cartilaginous; their prevailing colour was purplish; on their external surface they were distinctly granulated in texture; and on making a longitudinal section the same was perceptible throughout: it was remarkable that the cortical portion was exceedingly thin, so that the distance between the termination of the tubular part and the external surface was much less than in

* The Eighth Louis Gross Memorial Lecture, delivered at the Jewish General Hospital on the evening of October 17, 1945.

the healthy organ. In this respect, as indeed in most others, the kidneys agreed very exactly with a drawing which was made for me from the kidney of a dropsical patient about two years ago; and likewise with the kidney of the last patient, the only difference being, as far as I could discover, that in the kidneys from which the engraving is taken, the granular appearance was rather more marked, owing to the less general prevalence of the purple colour.

"In this case we again distinctly trace the existence of a highly diseased condition of the kidney, coupled with the secretion of albuminous urine. *The enlarged state of the heart would seem to bespeak some cause of obstruction to the circulation through the system beyond what we discovered, nor will I venture to say what share this might have had in giving rise to the dropsy* (italics mine)."

Bright had some interesting things to say about treatment and on pages 72 to 74 he wrote as follows:

"The diuretic remedy which I have generally used, has been the Squill in its different forms: but it has always acted best when given in combination with Hyoscyamus, or when a grain of Opium has been prescribed once or twice a day. Indeed I cannot but consider this an important part of the treatment, with a view to diminish the irritation of the kidneys, as well as to allay the general disturbance which must necessarily result to the constitution, from the circulation of blood which has been so imperfectly acted upon by these organs. Digitalis has in some instances been cautiously administered with temporary advantage, and seems by its power of checking the circulation to be well adapted to those cases where the pulse is sharp, as frequently occurs throughout the whole progress of this disease.

"One of the most important questions in the treatment of this class of dropsies, is the propriety of employing Mercury. It is consistent with the most successful treatment of many forms of inflammatory disease, that we should have recourse to the valuable combination of Calomel with Opium; and it is consistent with what is generally deemed good practice, that by the cautious use of Mercury we should endeavour to produce more healthy action, and to promote absorption when there is reason to believe that disease has left any chronic morbic action tending to produce unhealthy deposit in glandular structures. Still however, the cases which have proved most successful in my own practice, have generally been those in which I have rigidly abstained from the use of Mercury. In some cases I have seen the good effect of other remedies entirely interrupted by the mercurial action; and I have likewise seen several instances in which the cure, when mercurials have formed part of the plan, has been protracted to a great length; and a great many in which the full action of mercury has not prevented the regular progress of the disease, and its fatal termination. Yet I have undoubtedly seen well marked cases of this disease with decidedly coagulable urine, when taken early, in which the free use of mercury to complete ptyalism has not prevented the patients from deriving great, perhaps even perfect relief, from the remedies with which it was combined,—these remedies having been bleeding, purging, and diuretics. . . ."

Successor to Bright at Guy's Hospital in London which, in those years, was doing some of the most important pioneer medical work in the world, Sir Samuel Wilks[2] himself wrote on Bright's disease at length in the *Guy's Hospital Reports* in 1853. In the course of his long paper, he discussed the relationship of the abnormalities of various other parts of the body to the kidney and so-called Bright's disease. On page 292 of the 1853 volume of the *Guy's Hospital Reports*, Wilks wrote:

"The occurrence of diseased arteries in the chronic form of Bright's disease is well known, but the question has not yet been decided whether these two affections stand to each other in the relation of cause and effect, or whether they have a common origin. In no one case of Bright's disease, where hypertrophy of the left ventricle has existed, have I failed to find diseased arteries. On the other hand, I have witnessed, though seldom, cases of diseased arteries and hypertrophic heart without the presence of diseased kidney. A very large number of cases would be required to verify the opinion, but from the above facts it is that I place together the enlarged heart and state of the blood-vessels. Lately, a man, aet. 55, was in the hospital for many apoplectic attacks, he had become very fat, and at last died in a fit. The aorta and all the smaller vessels, including the cerebral and renal, were very diseased; the cardiac valves were all healthy, but the left ventricle extremely hypertrophied. In this case the kidneys contained an excess of fat, but were otherwise healthy."

The next important milestone and a paper fully as important as the writings of Bright concerning high blood pressure, before it was clearly recognized as such, was the article by Gull and Sutton[3] published in 1872. They wrote as follows:

"Dr. Bright and subsequent pathologists have fully recognized that the granular contracted kidney is usually associated with morbid changes in other organs of the body. The disease of the kidney and the coexistent morbid changes are commonly grouped together and collectively termed 'chronic Bright's disease'.

"In this communication we propose to consider the pathology of this morbid condition. We are induced to do this because our observations tend to show that the present prevailing pathological theories do not fully comprehend the whole history of the disease. . . .

"We are led to conclude that the kidney disease does not give rise to the vascular change. Our investigations show the disease under the following forms:

"(1) Kidneys often much contracted, heart much hypertrophied, minute arteries and capillaries proportionately thickened by 'hyalin-fibroid' formation.

"(2) Kidneys little contracted, but heart much hypertrophied, minute arteries and capillaries much thickened by 'hyalin-fibroid' substance.

"(3) Kidneys healthy, whilst heart much hypertrophied and minute arteries and capillaries much thickened by 'hyalin-fibroid' substance.

"These facts show that there is a morbid state in which the kidneys are contracted, the heart hypertrophied, and the minute arteries and capillaries altered by a 'hyalin-fibroid' formation. Further that the kidney changes are often, but not always, a part and parcel of the morbid state. The absence of such lesions of the kidneys proves that they do not constitute an essential and indispensable part of the general process. . . .

"We have next to consider the pathology of another morbid condition which forms part of the state known as chronic Bright's disease. We refer to hypertrophy of the left ventricle of the heart unaccompanied by any valvular defect or adhesion of the pericardium.

"The morbid appearances of this hypertrophy are so well known that it is not requisite for us here to describe them, but it is necessary we should state

that we have found the minute arteries in the walls of the heart much thickened by the formation of 'hyalin-fibroid' substance already described. Bright, to account for this hypertrophy, says: 'The most ready explanation appears to be that the quality of the blood is altered by the kidney disease. The blood in consequence affects the minute and capillary circulation so as to render greater action necessary to force it through the vascular system'. Many pathologists have adopted this explanation. . . .

"There is, however, evidence on the other hand which appears to be strongly opposed to these views. Thus the cardiac hypertrophy and the renal disease are no doubt frequently associated, as we have said; but this does not prove that there is a relation of cause and effect between the two states; for it is evident that both these morbid conditions may be dependent on a third more general one. Moreover, against this commonly accepted explanation it can be shown that in many cases of chronic kidney disease the heart is not hypertrophied. Dr. Wilks has mentioned to us that in many cases of large white kidney he has found the heart free from hypertrophy. Dr. Dickinson states that simple hypertrophy of the left ventricle is rarely associated with any form of renal disease excepting granular degeneration. . . .

"We attribute the hypertrophy to the vascular change."

Charcot gave some interesting lectures on "Bright's disease of the kidneys" at the School of Medicine, in Paris in the 1870's which were translated in 1878 by Millard.[4] On pages 56 and 57 of Millard's translation there were the following interesting comments.

"It is generally admitted with Traube, that in such of the glomeruli as continue to act (the quantity of blood remaining always the same), the pressure of the blood upon the arterial walls and its rapidity would be relatively great: this would result in additional labour by the glomeruli; and on the other hand, the momentary excess of water in the blood resulting from the renal impermeability, produces in the entire arterial system a condition of tension which, so long as the heart continues to act with energy, contributes still more to this supplementary elimination. . . .

"Be the explanation what it may, it is to the augmentation of the arterial tension that is attributed, theoretically, the *hypertrophy of the left ventricle* without valvular lesion, which often accompanies interstitial nephritis. . . ."

At the end of the nineteenth century and the beginning of the twentieth, sphygmomanometry was developed and introduced into clinical medicine and in 1915 Janeway[5] summarized our knowledge of the subject succinctly in an important monograph. He referred to "the clear recognition, by the unaided senses of the clinician, of the existence and association of high blood pressure, but no material advance in its detection or in the study of the problems presented by it since the days of Richard Bright half a century before."

Many papers on the pathology, diagnosis, and prognosis of hypertension and the hypertensive heart were published in the 1920's, good examples of which were those by the two Fahrs,[6, 7] Paullin and associates,[8] and Bell and Clauson.[9]

In 1934 Goldblatt[10] revived interest in the relationship of kidney disease to hypertension by demonstrating the hypertensive effect of renal ischæmia by clamping the renal vessels in experimental animals. Clinical application of this important discovery, however, proved disappointing in that only a small minority of patients with unilateral kidney disease and hypertension were relieved of their high blood pressure by excision of the affected kidney. In the years that followed during the latter half of the decade of the 1930's much interest was shown in the isolation of a pressor substance from the blood of hypertensive animals and patients; the Argentine group[11] called it hypertensin while Page and his collaborators[12] named it angiotonin. Attempts to find an antidote for this pressor substance which would be effective in the practical control of hypertension clinically have so far been unsuccessful.

In 1936, 109 years after Bright, we had thus advanced but little except in the clear recognition that it was hypertension that caused the heart strain and enlargement and failure. The problem of the relative importance of the rôles played by kidney disease, pressor substances in the blood, and excessive sympathetic nerve activity in the causation of "essential" hypertension was still unsolved and indeed today still demands clarification. In the *New England Journal of Medicine* of April 9, 1936, an article by the present writer appeared entitled "A note on the common occurrence of serious involvement of the heart in hyperpiesia".[13] In that article I wrote:

"Unfortunately, by the time hypertensive heart disease itself becomes evident the condition is advanced to the stage where little but palliation is possible. Heart failure may be checked or relieved for a few years but the fundamental factor, hyperpiesia, is out of control in the present stage of our knowledge despite the temporary effect of various more or less radical and non-specific therapeutic measures."

Twenty-two per cent of 5,808 patients with cardiovascular symptoms or signs, whom I had seen in private practice then, in the course of 15 years, had hypertension. The great majority (72% of 100 consecutive cases) who were followed to the time of their death, died before the age of 70 of cardiovascular disease closely connected with hypertension.

LUMBO-DORSAL SYMPATHECTOMY

Now, nine years later, in 1945, a dramatic change has come, an advance in the control of this condition far greater than any during the previous century or more. It has two aspects:

first and most important, the control of the blood pressure before the occurrence of serious effects on heart, brain, or kidneys; and second and most interesting from the standpoint of the hypertensive heart, that is, of the heart already demonstrating the effect of the strain of the high pressure, the relief of the cardiac signs and symptoms, which in former days were only partially or temporarily cleared by the measures at our disposal. The new treatment to which I refer is not applicable to all cases of hypertension that we meet nor is it successful in all cases to whom it is applied, but, in my experience, it has proved to be so far superior in its effects to any other therapy tried by me in the last quarter century, and occasionally so dramatic in its results, that the dawn of a new era in the progress of our understanding and management of high blood pressure may be hailed, a milestone in our slow and belated progress along this path. There is still much to learn and better and simpler methods of prevention and treatment must be sought, but we should recognize at its true worth the accomplishment already secured and make the most of it. The accomplishment to which I refer is the technique of lumbodorsal sympathectomy (splanchnic resection) as developed by Smithwick,[14] not that previously carried out.

Two decades ago sympathectomy for malignant hypertension was introduced by Rowntree and Adson[15] who published a very interesting article. They wrote the following:

"Since it has fallen to our lot to treat a great many patients having malignant hypertension with results which are ultimately disappointing, it occurred to us that relative freedom from vascular spasm might be attained through the removal of the vasoconstrictor influence of the sympathetic nerves to the vessels of the leg. It was thought that this might not only lower the systemic blood pressure, but also provide simultaneously an area of diminished resistance which would give way under strain and thereby serve somewhat in the capacity of a safety valve for the protection of the cerebral and retinal vessels. In the erect posture, hydrostatic pressure also should favour the effectiveness of this area of lowered resistance for the protection of vital functions during periods of activity. Consequently, in April, 1924, a patient suffering from severe arteriosclerosis, chronic nephritis and terminal uræmia was subjected under local anæsthesia to a Leriche-Handley operation on the left femoral artery in Scarpa's triangle. The course of the disease was in no way affected, and no significant effect could be determined relative to general blood pressure or to the pressure in either extremity. But it was felt that the case was hardly suitable for the experiment, since the patient was moribund at the time of operation.

"As the vasodilator effects following lumbar sympathetic neurectomy in cases of spastic paraplegia became apparent, a patient with typical advanced malignant hypertension was subjected to bilateral lumbar sympathetic neurectomy (removal of the ganglions with the rami and all the branches and trunks of the second, third and fourth lumbar segments of the sympathetic chain) through a median abdominal incision. This approach was chosen in preference to Royle's lateral approach, because it was decided to remove the lumbar sympathetic ganglions and rami on both sides at one operation, and because better exposure could be obtained by going directly down on the sympathetic chain.

"*Operation and result.*—This case seemed to fall into the group described last year by Wagener and Keith, in which eye-ground changes are definite, while the cardiac and renal functions are still practically unimpaired. The patient was admitted to the hospital, but he did not respond at all well to rest, nitrites, and warm baths. Because of his age (33 years) and excellent physical condition aside from this vascular involvement, the possibility of relief by abdominal sympathetic neurectomy was discussed with him. Even recognizing that the operation was, in a sense, entirely experimental, he evidenced great enthusiasm, stating that he was willing to undergo any procedure that offered hope of permanent, or even temporary, relief. During the three weeks of medical treatment in the hospital, his blood pressure continued high, the systolic being from 170 to 200 and the diastolic from 90 to 130, and he complained of marked blurring of vision, headache and weakness.

"When the patient arrived in the operating room, the systolic pressure was 255, and the diastolic 190. The blood pressure was followed and recorded during the course of the operation.

"The patient's postoperative course was excellent. At first the subjective improvement was striking. As shown graphically, the blood pressure level was distinctly lowered, at least for the two weeks following operation. The headaches, which had previously occasioned such great distress, entirely disappeared, and recurred but once during the first month and then only for a brief period. His vision improved markedly, the blind spots decreasing materially so that he read almost any print with comfort. No change was noted in volume or composition of the urine; certainly the efficiency of the kidney was in no way impaired.

"While the patient was getting up and about, the blood pressure gradually mounted. On one occasion, the headache and epigastric distress recurred for a day or so. He now responded well to nitrites and to the hypertension baths, in this respect exhibiting marked improvement over his former condition. A letter received four and one-half months after the operation expresses great satisfaction over the subjective improvement. Only on one occasion had he suffered from headache and epigastric distress. At six months he reports recurrence of hypertension (systolic blood pressure, 220, and diastolic, 120), but otherwise, is in good health. However, the period elapsing is entirely too short to admit of conclusions as to the effectiveness of this procedure. The case is reported at this time merely to call attention to the possibilities of abdominal sympathetic neurectomy and to the interesting changes observed subsequent to the operation."

As indicated in their article Rowntree and Adson were stimulated by the pioneer work of Royle and Hunter.[16] The sympathectomy for hypertension was elaborated by Peet[17] and others ten years later in the treatment of hypertension, but the results were disappointing, and the present writer lacked enthusiasm and interest in this type of therapy, after seeing the effects, until his propinquity to Smithwick, working in the same hospital, proved to him that the proper development of the original idea was bearing fruit at last. This evolution is in a way comparable to two other major developments of late

years. In the days before the announcement by Minot and Murphy[18] of the control of pernicious anæmia by the use of liver, that organ had been often a part of the routine diet given to patients with severe anæmia, but it had not been prescribed in large enough dosage or in the most effective manner. Also before 1944 penicillin in average doses had been used ineffectively in the treatment of subacute bacterial endocarditis, but early in 1944 Loewe *et al.*[19] presented evidence that massive dosage might control that dread disease and since then a new era has dawned in the therapy of bacterial endocarditis. And so it is with sympathectomy in hypertension; a little is relatively ineffective, but more radical nerve section can be successful.

In the course of his surgical treatment of more than 800 cases of hypertension in the last six and one-half years, Smithwick has made many important observations on blood pressure reactions to posture, cold, and sedation, and on the state of the kidneys both grossly and by biopsy followed by microscopic examination and by renal functional studies. He has summarized his study of more than 1,000 kidneys in over 500 living hypertensive patients as follows:

> "It would appear that data pertaining to the gross appearance of the kidneys, accumulated during the course of the surgical treatment of hypertensive patients, indicate clearly that contracted granular kidneys do not antedate the hypertensive state in man.
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> "For the first time, an opportunity for the microscopic study of renal arterioles of living patients with continued hypertension has presented itself. The findings are also at variance with autopsy material. They suggest that pre-existing renal arteriolar disease of a moderate or marked degree is not a *sine qua non* to the hypertensive state.
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> "For the first time, an opportunity has arisen whereby the pathological changes can be correlated with the physiological state of the kidney. It has been noted that neither a marked reduction in quantity (ischæmia) nor a change in the nature of renal blood flow (constriction of the efferent glomerular arteriole) is obligatory to the hypertensive state.
>
> "When renal vascular disease and hypertension are associated, it is difficult to disprove a cause and effect relation; and no one questions the importance of renal disease, when present, as a factor in human hypertension. However, to make this a universal explanation for hypertension in man is not in keeping with the facts. A concept is needed, which will explain the cause of hypertension in the absence of kidney disease, and the absence of hypertension in the presence of kidney disease.
>
> "The surgical treatment of hypertension has introduced a new factor, the autonomic nervous system, into the already complicated picture of the hypertensive state in man. It has contributed data which cast doubt upon the primacy of renal arteriolar disease as the sole causative factor."

The treatment of the hypertensive heart is threefold: first, and of course fundamental, the control of the cause, until recent years in the main a vain effort; second, the palliation of the effects of the hypertension by the institution of physical and mental "rest cures" which did not cure but did prolong life, especially if the victim was willing to live an invalid and often unhappy existence; and third, the direct support of the strained and often weakened heart by the use of drugs, in particular digitalis and, when needed, diuretics, as mentioned by Bright in 1827, and by the strict enforcement of more or less complete rest. It was true, and it still is, that sedation helps considerably not only in sparing the heart the strain of extra physical and nervous activities, but in the actual reduction of the blood pressure, both systolic and diastolic, in many cases of hypertension. To get full effect from drug sedation, however, which is comparable to that secured by Smithwick's nerve section, one must put the patient to sleep, often a deep sleep such as results from the sedation test carried out preoperatively by Smithwick by the administration of 3 grains of amytal sodium hourly for three doses. It is the lumbodorsal sympathectomy that has not infrequently been the fairy prince awakening the victim of severe hypertension, like the princess in the fable, from the sleep that was the only other alternative for the prolongation of life.

But you will ask, does the effect last? Certainly that of deep sleep on the heightened blood pressure does not last long after the patient awakes, a few hours perhaps. Nor does the effect of a prolonged rest of several weeks last long, a few months at best, as demonstrated quite conclusively in a study of the effect of anæsthesia and bed rest in 100 cases of hypertension subjected to major operations;[20] of course, the operation itself must also be considered as a strain, but in these cases referred to that strain was but temporary and far overbalanced by the real and prolonged rest. And all of us have had similar experience in the application of prolonged rest (for periods of weeks or months) in the treatment of hypertension, though there are rare or very rare exceptions.

Nor do diets seem to cure hypertension, although starvation will often reduce the pressure; we have not yet obtained adequate follow-up data on the effect of the recently introduced "rice diet".[21] We must have years of follow-up experience in any treatment of hypertension before we can speak with confidence, and that we have now secured in the appraisal of Smithwick's lumbodorsal sympathectomy. More than six years have passed since his more radical

operation was introduced and some of his earliest patients have continued to maintain a normal or a greatly reduced blood pressure; they have not relapsed as have practically all cases treated by other measures, medicinal or otherwise. One should mention rare exceptions to this statement about medicines; there are individuals, in the writer's experience very few indeed, whose hypertension has been partially controlled for years by the habitual use of the thiocyanates; for the majority of patients, however, thiocyanate therapy proves either too toxic or disappointing.

It is thus evident that the crux of the treatment of the hypertensive heart is not the imposition of an invalid life nor the support of the myocardium by digitalis, nor the use of diuretics or special diets, but the control of the hypertension itself. Some day we may hope for a simple specific that can be taken without difficulty daily or weekly to keep the blood pressure normal, but until that time comes we must not overlook the surgical treatment that has proved to be specific itself and which indicates the rôle which the sympathetic nervous system plays in at least a share of the origin of the common type of high blood pressure. And we should not countermand the operation simply because the heart is affected. To be sure, it is certainly better to carry out the procedure early before the heart and brain and kidneys are damaged, but at least some of the evidences of such damage or strain are reversible; and, in particular, I believe, the very presence of objective evidence of heart disease, that is, of the hypertensive heart, even of some degree of heart muscle failure itself, is, if not extreme, an indication of the crying need of operative relief, and not a contraindication as was once thought. This reminds one of the important contribution twenty years ago by Lahey and Hamilton[22] who initiated our present concept of the reversibility of heart disease by their bold surgery in the performance of subtotal thyroidectomy in thyrocardiac patients who were in actual heart failure, and whose hearts and lives were saved by the surgical operation which got rid of the very strain that caused the hearts to fail.

And now to illustrate the effect of Smithwick's lumbodorsal sympathectomy on the hypertensive heart disease of patients whom I have myself followed, I shall herewith present briefly three case histories, which show also the type of hypertensive patient most amenable to the treatment. Failures still occur in the application of the operation but they grow steadily fewer as time and experience demonstrate the criteria we should follow.

CASE 1

H.L., 31 years old, a surgeon, entered the Massachusetts General Hospital in the late summer of 1942 for consideration of his severe hypertension and treatment of his failing heart. He had had high blood pressure for several years, and on admission to the hospital we found it to measure 165 systolic and 136 diastolic. He had become breathless, his heart showed enlargement, gallop rhythm, and accentuation of the pulmonary second sound, and there was alternation of the pulse. His renal status, though not normal, was satisfactory: albuminuria 1+ and specific gravity of urine up to 1.008, renal function by phenolsulphonephthalein 55% in two hours; the pyelogram showed a calculus on the left. His blood pressure reactions were favourable: in the sedation test the pressure dropped to 135 systolic and 98 diastolic; the standing posture raised the systolic pressure to 179 mm. and the diastolic to 147 mm.; immersion of one hand in cold water (4° C.) for 1 minute raised the pressure from 179 mm. to 218 systolic and from 147 to 170 diastolic in the standing position. The electrocardiogram was quite abnormal, with inversion of the T waves in Leads 1 and 4, with no clinical evidence of coronary insufficiency.

Lumbodorsal splanchnic resection was carried out first on the right side October 1, 1942, and then on the left side October 13. Soon thereafter (2 to 3 weeks) his blood pressure and electrocardiogram became normal: the systolic pressure was 104/75. One year postoperatively he felt perfectly well, was operating surgically four hours a day, and his blood pressure was normal (120/80). Two years postoperatively he was still in excellent health and working hard; his blood pressure was 96/64 and his electrocardiogram was normal save for flattening of the T waves in Lead CF_5. Three years postoperatively he feels well, with normal blood pressure. His only complaint is that he perspires excessively in the upper part of his body in hot weather.

CASE 2

S.D., 40-year old female, entered the Massachusetts General Hospital in December, 1942, for treatment of hypertension of 9 years' duration which had caused a "mild stroke" with temporary aphasia one year previously. Examination showed moderate cardiac enlargement and left-sided heart failure, for which she was treated intensively before operation. Her blood pressure readings were 215/145. Her electrocardiogram showed evidence of moderate left ventricular strain and hypertrophy: left axis deviation, depression of the S-T segments and diphasic T waves in Leads 1 and 2, and low T waves in Lead 4. Her renal studies were satisfactory, showing albuminuria 1+, specific gravity of urine 1.014, phenolsulphonephthalein excretion 45 to 85% in two hours, and non-protein nitrogen 28 mgm. %; the pyelogram was normal.

On January 16, 1943, lumbodorsal splanchnic resection was carried out on the right side and on January 30 it was done on the left side. Within 2 to 3 weeks her blood pressure was 116/80 and one year postoperatively it was 140/95. She has been in good health to date, two years after the operation; her blood pressure readings February 15, 1945, were 138/105.

CASE 3

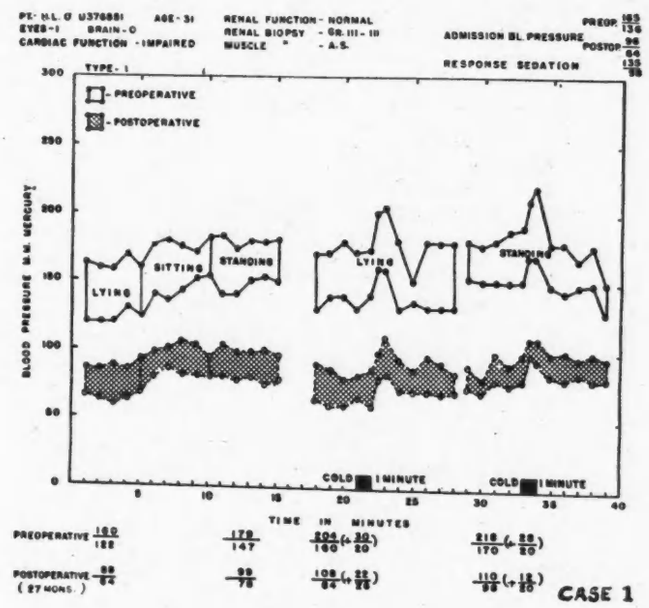
M.M., 45 years old, a male nurse, entered the Massachusetts General Hospital in February, 1943, for treatment of his hypertension of fifteen years' duration and for recent slight congestive failure. On admission to the hospital we found his blood pressure to be 240/140. His heart was enlarged with gallop rhythm and there were râles at the lung bases cleared by rest and digitalis before operation. His electrocardiogram was abnormal,

showing slight left axis deviation, deep inversion of the T waves in Lead 1, and slight inversion of the T waves in Lead 2. His renal function tested at 53 to 80%, the urine showed 1 to 2 plus albumin with specific gravity ranging from 1.016 to 1.025. The pyelogram was normal. His blood pressure reactions were favourable: in the sedation test the pressure dropped to 142/80; the standing posture raised the blood pressure to 226/146; immersion of one hand in cold water (4° C.) for 1 minute raised the standing blood pressure to 250/166 and the lying blood pressure to 246/155.

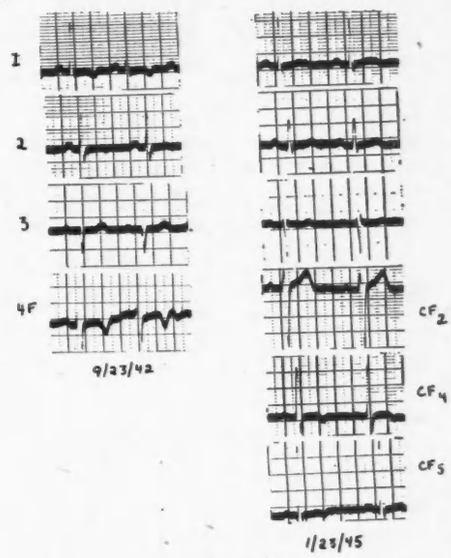
Lumbodorsal splanchnic resection was carried out first on the right side on February 27, 1943, and then on the left side on March 16. Soon thereafter (2 to 3 weeks) his blood pressure was 163/93 and 13 months postoperatively it was 164/105. Electrocardiogram showed definite improvement, with but slight residual inversion of T_1 (only half as deep as in February, 1943), and diphasic T_2. He had been feeling very well to date and working hard with excellent cardiac function.

DISCUSSION

I have chosen these three examples out of scores of cases of hypertension treated surgically by Smithwick because they are representative of favourable results of the relief of severe heart strain with variation in the degree of reduction of the blood pressure. It is evident that it may not be necessary to bring the blood pressure all the way down to normal in order to mitigate the cardiac symptoms and signs, though doubtless the more normal the pressure the better will



CASE 1



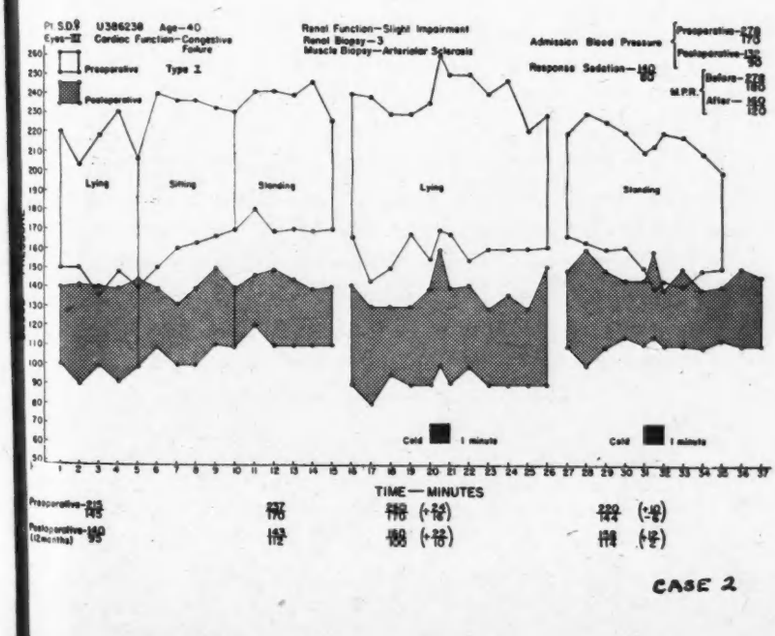
H.L. 376851

N.R., rate 85 to 90, inverted T waves in Leads 1, 2, and 4F.

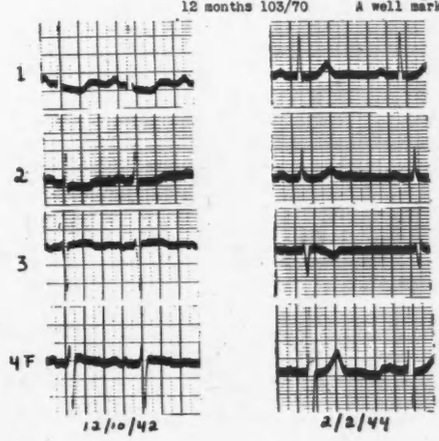
Preop.B.P. 160/122
Dates of Operations
R 10/1/42
L 10/13/42

Postop. B.P.
2-3 weeks 104/75
12 months 103/70

N.R., rate 70, low to upright T waves in Leads 1,2, and 3, upright T waves in Lead CF_2, slightly inverted T waves in Leads CF_4 and CF_5. A well marked improvement.



CASE 2



S.D.386238

N.R., rate 80, moderate left axis deviation, sagging S-T segments and low T waves in Leads 1 and 2, flattish T waves in Leads 3 and 4F(digitalis effect).

Preop.B.P. 215/145
Dates of Operations
R 1/16/43
L 1/30/43

Postop. B.P.
2-3 weeks 116/80
12 months 140/95

N.R., rate 55, very little left axis deviation, well within the normal range, upright T waves in Leads 1,2, and 4F, and inverted T waves in Lead 3. The return to a completely normal record

be the future. It is important to observe also that the upright position may act paradoxically in the cases that have been operated upon with reduction of pressure in changing from the supine and the sitting positions. And finally, with time the pressure may settle to a lower level rather than climb again.

The most favourable case from the standpoint of blood pressure reduction itself, whether or not there is already evidence of hypertensive heart disease, is the relatively young person, under the age of 45 years, with elastic blood vessels, satisfactory renal function, high diastolic levels with relatively low pulse pressure (pulse pressure one-half the diastolic pressure or less), and well marked reactions of blood pressure to posture, cold, and sedation. Women with pyelonephritis have shown the best results of all.

Not only is the hypertensive electrocardiographic pattern cleared or much lessened by the splanchnic resection in more than half of all the hypertensive patients who show it preoperatively,[23, 24, 25] but heart size as determined by careful x-ray study may show a decrease, even before symptoms appear.

SUMMARY

For the first time since Bright described the hypertensive heart in 1827 we have an effective weapon in the form of Smithwick's radical lumbodorsal splanchnic resection for the control of essential hypertension in a large percentage of the younger cases. This procedure has made possible the relief of intolerable strain on the heart with the clearing on occasion of the symptoms and signs of hypertensive heart disease and failure.

REFERENCES

1. BRIGHT, R.: Reports of Medical Cases Selected with a view of Illustrating the Symptoms and Cure of Diseases by a Reference to Morbid Anatomy, Longman, Reese, Orme, Brown, and Green, London, 1827.
2. WILKS, S.: Cases of Bright's Disease, with Remarks, *Guy's Hospital Reports.* Second series, edited by E. L. Birkett and A. Poland, Vol. VIII, John Churchill, London, 1853.
3. GULL, W. W. AND SUTTON, H. G.: *Medico-Chirurgical Transactions*, **55**: 18, 1872.
4. CHARCOT, J. M.: Lectures on Bright's Disease of the Kidneys by J. M. Charcot Collected and Published by Drs. Bourneville and Sevestre Editors of the Progrés Medical, and Translated, with the permission of the author, by Henry B. Millard, New York, William Wood & Co., 1878.
5. JANEWAY, T. C.: *Bull. Johns Hopkins Hosp.*, **26**: 341, 1915.
6. FAHR, TH.: Eingegangen am 19 Mai, 1922.
7. FAHR, G. E.: *J. Am. M. Ass.*, **80**: 981, 1923.
8. PAULLIN, J. E., BOWCOCK, H. M. AND WOOD, R. H.: *Am. Heart J.*, **2**: 613, 1926.
9. BELL, E. T. AND CLAWSON, B. J.: *Arch. Path.*, **5**: 939, 1928.
10. GOLDBLATT, H. *et al.*: *J. Exper. Med.*, **60**: 347, 1934.
11. HOUSSAY, B. A., FASCIOLO, J. C. AND TAQUINI, A. C.: *Rev. Argentina d. Cardiologia*, **5**: 291, 1938.
12. PAGE, I. H. AND HELMER, O. M.: *J. Exper. Med.*, **71**: 29, 1940.
13. WHITE, P. D.: *New England J. Med.*, **214**: 719, 1936.
14. SMITHWICK, R. H.: *Surgery*, **7**: 1, 1940.
15. ROWNTREE, L. G. AND ADSON, A. W.: *J. Am. M. Ass.*, **85**: 959, 1925.
16. ROYLE, N. D.: *Surg., Gyn. & Obst.*, **39**: 701, 1924.
17. PEET, M. M.: *Univ. Hosp. Bull.*, Ann Arbor, Michigan, **1**: 17, 1935.
18. MINOT, G. R. AND MURPHY, W. P.: *J. Am. M. Ass.*, **87**: 470, 1926.
19. LOEWE, L., ROSENBLATT, P., GREENE, H. J. AND RUSSELL, M.: *J. Am. M. Ass.*, **124**: 144, 1944.
20. ROJAS, F., SMITHWICK, R. H. AND WHITE, P. D.: *J. Am. M. Ass.*, **126**: 15, 1944.
21. KEMPNER, W.: *North Carolina M. J.*, **5**: 125, 1944.
22. HAMILTON, B. E.: *Ann. Surg.*, **90**: 750, 1929.
23. EVANS, E., MATHEWS, M. AND WHITE, P. D.: *Am. Heart J.*, **30**: 140, 1945.
24. WHITE, P. D., SMITHWICK, R. H., MATHEWS, M. W. AND EVANS, E.: *Am. Heart J.*, **30**: 165, 1945.
25. CANABAL, E. J., WARNEFORD-THOMSON, H. F. AND WHITE, P. D.: *Am. Heart J.*, **30**: 189, 1945.

COMMENT

The short discussion which followed this paper was mainly in the form of questions. Dr. White was asked whether he would say something about other measures of a non-surgical nature, particularly diet. Dr. White welcomed the opportunity to point out that he had been unable throughout the war years, to give undivided attention to following up dietary methods of treatment of hypertension and could only say as his tentative impression that patients did well on the rice diet, but tended to relapse on giving it up. Also these diets were sometimes highly repugnant. He went on to say that as regards the operative treatment of which he had spoken in detail, it was to be remembered that at best it was drastic: true that the operative mortality was very low, but the operation was extensive and must always be regarded as of a major type. A further objectionable feature was the prolonged convalescence with its uncomfortable side effects. Also the selection of cases required very careful study; there were many which were unsuitable for this treatment.

CHRONIC PROSTATITIS ASSOCIATED WITH NON-SPECIFIC URETHRITIS*

By Harry G. Cooper, M.D. and John T. MacLean, M.D.

Montreal Military Hospital, Montreal

ONE of the major medical problems in the armed services today is the diagnosis and treatment of chronic urethral discharge and chronic prostatitis. In a short while this will become a civilian problem. The magnitude of this problem is in part due to an increased incidence of the disease, but is chiefly due to the fact that effective treatment of the chronic cases has, we believe, been almost unknown. The results of routine treatment carried out under our direction were so unsatisfactory and discouraging as to make it obvious that we should concern ourselves with this problem.

Early in May, 1945, routine treatment, using sulfonamide therapy, penicillin 100,000 units,

*From Urology Special Treatment Centre, Montreal Military Hospital and Ste. Anne's Hospital, Ste. Anne de Bellevue, Que.

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irrigations, diathermy, and urethral dilatations, was discontinued. In an endeavour to find a more satisfactory form of therapy a detailed investigation of the cases that had failed to respond to the accepted forms of therapy was carried out; 150 cases have been studied to date. This report deals with the first 100 so studied. It was found that the cases could be divided into three main groups: those with (1) a previous history of gonorrhœal urethritis; (2) a previous history of non-specific urethritis; and (3) no previous history of urethritis. In this third group the main complaints were varied, but urological in nature.

All of these patients had had from one to ten previous hospital admissions, the average number being three. The average number of hospital days was 4.8 days; the maximum number being 120 days. The range in years was from 19 to 53 years of age; the average age being 26.5 years.

In 100 cases studied, as indicated in Table I, 36% of cases had a previous history of gonorrhœa. In an additional 50% there was a history of previous urethral discharge which had been reported negative for gonorrhœa, and classified as non-specific urethritis. The remaining 14% had no evidence of previous urethritis. The symptomatology is also indicated in Table I.

The chief symptoms complained of were: urethral discharge, frequency, burning, terminal hæmaturia, vague perineal discomfort, and backache. In the group of cases in which there was a previous history of gonorrhœa or non-specific urethritis, urethral discharge was present in 84 to 91% of the cases; being the presenting symptom in over 70% of the cases. In Group III, in which there was no previous history of urethritis, a urethral discharge was the presenting symptom in only 21%. Pyuria without symptoms was present in 28% of this group, while vague perineal discomfort, frequency, and backache occurred in another 21%. This is the group in which the diagnosis is so apt to be overlooked. A combination of these symptoms existed in many patients.

In those who had a discharge, it was thin, watery, and grey in 90%, and a thick mucoid material of varying shades of yellow, in the remaining 10%.

ORIGIN OF CONDITION

The majority of these patients gave a history of alcoholism and sexual excess immediately preceding the onset or recurrence of symptoms. We believe this is a factor in lowering the resistance of the urethra and prostate, favouring subsequent invasion by: (*a*) Organisms from the host which are normally non-pathogenic. They may reach the prostate via lymphatics or possibly the blood stream. (*b*) Exacerbation of a previous prostatitis in which there is still some residual infection present. (*c*) Organisms from a carrier that may or may not be pathogenic to the carrier. In two cases there was no extramarital exposure, and the wives did not exhibit any signs or symptoms of infection.

TABLE I.

SYMPTOMATOLOGY

	Group I *Previous history of gonorrhœa*		*Group II* *Previous history of non-specific urethritis*		*Group III* *No previous history of urethritis*		*Total of 3 groups*
Symptoms	*No. of cases* *36*	*%* *36*	*No. of cases* *50*	*%* *50*	*No. of cases* *14*	*%* *14*	*No. of cases and %* *100*
Urethral discharge:							
Presenting symptom	26	72	35	70	3	21.5	80
Associated symptoms	7	19	7	14	2	14.5	16
Total		*91*		*84*		*35*	
Frequency	1	3	1	2			2
Burning			1	2	1	7	2
Terminal hæmaturia					1	7	1
Vague perineal discomfort	1	3	4	8	1	7	6
Backache	1	3			2	14	3
Signs							
Pyuria (without symptoms)			2	4	4	28	6
Total						*28*	

BACTERIOLOGY

The bacteriology showed on direct smear and culture: staphylococci alone in 55 cases, diphtheroids in 10 cases, and staphylococci in combination with micrococci, streptococci, and trichomonas, in an additional 32 cases. Gonococci were found once, and trichomonas vaginalis twice.

A diagnosis was made by: (1) the history and symptoms; (2) the presence of a urethral discharge; (3) the three-glass urinalysis, and (4) the examination of the prostatic fluid.

The symptoms of urethral discharge, frequency, burning, terminal hæmaturia, and vague perineal discomfort, are almost pathognomonic of the condition present. Palpation of the prostate is not indicative of the pathology present. In some cases the gland is firm and fibrosed; in others it is soft and normal to palpation, thus indicating that an examination of the prostatic fluid is an essential step in the establishment of a diagnosis.

TREATMENT

In five cases, preceding the hundred reported in this series, stilbœsterol mgm. vi was given daily for one week. There was some clinical improvement, but the number of pus cells in the prostatic fluid was not materially reduced. Stilbœsterol therapy was discontinued for this reason, and because of the possibility that administration over a period of time might result in sterility.[3]

In considering returning to penicillin therapy we felt that with the usual course of 100,000 units of penicillin in twenty-four hours, the degree of tissue saturation was probably adequate, but that it was not maintained for a sufficient length of time. It was therefore decided to give experimentally 25,000 units every four hours for 14 days, and to observe the results obtained. Prostatic massage was done twice a week, and the fluid obtained examined. Subsequent cases revealed that the prostatic massage was an essential part of the treatment. A total of 2,100,000 units of penicillin was given each patient. (Studies of the urine and blood penicillin levels were not carried out.) On admission, cultures for gonorrhœa and other organisms were taken from either the urethral discharge, or prostatic fluid. Bi-weekly examinations of the discharge or prostatic fluid were made, and the cell count noted. It was found that symptomatic improvement was first noticed at the fifth to the tenth day of treatment, usually occurring at the seventh day, at which time there was also found an appreciable decrease in the number of pus cells in the prostatic fluid. In many cases the prostatic fluid is obtained by gentle compression of the gland without true massage.

In classifying the results obtained, a "cure" is defined as one in which (*a*) the patient is entirely asymptomatic, and there is no urethral discharge; (*b*) the three-glass urinalysis is normal; (*c*) the prostatic fluid on culture is negative for gonococci; (*d*) the number of pus cells in the prostatic fluid is reduced to below five per high power field; and (*e*) re-examination in three months' time confirms these findings. Re-examination is carried out routinely at monthly intervals. "Apparently cured" would indicate that the patient has satisfied the criteria (*a*) to (*d*) above, but has not yet returned for the three-month check-up. The term "improved" is used to indicate that the patient is asymptomatic, but the prostatic fluid shows more than five pus cells per high power field and less than twenty. The term "failure" is used to indicate those cases in which symptoms or signs persist.

Complications of treatment.—There were six failures on penicillin therapy alone, for the reasons shown in Table II.

TABLE II.

COMPLICATIONS—
FAILURES ON PENICILLIN THERAPY ALONE

Complications in all three groups	*No. of cases*	*Additional treatment carried out*	*End result of treatment*	
			Cured	*Apparently cured*
Redundant foreskin.	2	Circumcision	1	1
Small external urinary meatus...	1	Meatotomy		1
Stricture of urethra.	1	Urethral dilatation		1
No stricture of urethra on calibration.....	2	Urethral dilatation and urethroscopy		2

When the complications were corrected by circumcision, meatotomy, or dilatation, as indicated, the end results were satisfactory. Calibration of the urethra with bougie-a-boule is always carried out before urethral dilatation. One was cured and five were apparently cured. If these five maintain their status at the three-month examination they will then be classified as "cured".

There were two cases of trichomonas vaginalis. They were treated with atabrin, gr. 1½ three

times a day for five days. In one the discharge disappeared entirely; in the other, a mixed infection, the discharge continued but trichomonas was absent.

End results of treatment.—All 100 patients were asymptomatic at the time of discharge from the hospital, soon after the completion of the two weeks of treatment. The end results of treatment are shown on Tables III and IV. Seventy-five per cent of them were "apparently cured" (the number of pus cells in the prostatic fluid was below five per high power field), and the remaining 25% were "improved" (the number of pus cells in the prostatic fluid was above five per high power field, but below twenty). At the re-examination, two months later, 74 were still "apparently cured", and 10 "improved", although 15 could not be traced. There was one recurrence in this group. He denied re-exposure. He was readmitted to the hospital and treated with irrigations of protargol, ¼ of 1% four times a day. He was not given any further penicillin treatments. Urethroscopy showed an apparently normal urethra. He was discharged from the hospital, asymptomatic and improved, two weeks later.

The results for the three-month re-examination are not yet available. Of the 20 patients who were due for this examination and have reported back, 14 were cured, and 6 were improved. All 20 were asymptomatic.

TABLE III.

END RESULTS OF TREATMENT

	On discharge from hospital		*On 2 month re-examination*		*On 3 month re-examination*	
	No.	*%*	*No.*	*%*	*No.*	*%*
Group I—36 cases (previous history of G.C. urethritis)						
Cured	..	..	..	..	4	
Apparently cured	25	69.4	26	72.2	..	
Improved	11	30.6	5	13.9	1	
Failure	..	..	..	..	..	
No follow-up available	..	..	*5*	13.9	*31*	
Group II—50 cases (Previous history of non-specific-urethritis)						
Cured	..	..	..	..	9	
Apparently cured	38	76.0	35	70.0	..	
Improved	12	24.0	4	8.0	4	
Failure	..	..	1*	2.0	..	
No follow-up available	.	..	*10*	20.0	*37*	
Group III—14 cases (No previous history of urethritis)						
Cured	..	..	..	..	1	
Apparently cured	12	85.7	13	92.8	..	
Improved	2	14.3	1	7.2	1	
Failure	..	..	..	..	..	
No follow-up available	..	..	..	..	*12*	

*There was one recurrence in Group II.

TABLE IV.

END RESULTS OF TREATMENT
TOTAL OF ALL 3 GROUPS—100 CASES

End result	*On discharge from hospital No. of patients*	*%*	*On 2 month re-examination No. of patients*	*%*	*On 3 month re-examination No. of patients*	*%*
Cured	..		..		14	
Apparently cured	75		74		..	
Improved	25		10		6	
Failures	..		1 (recurrence)		..	
No follow-up available	..		*15*		*80*	

INFORMATION OBTAINED FROM STUDIES OF AN ADDITIONAL FIFTY CASES NOT REPORTED IN THIS GROUP

As already stated, there have been 50 cases investigated in which the study is not yet completed. We have learned some interesting facts from these additional cases.

Caspar,[1] in a study of the cultural characteristics of gonococci, has made what we consider to be a most significant observation. He has in many instances been able to curette from the urethra of so-called cured cases of gonorrhœa, a large monoform cell which on culture grows out a Gram-negative diplococcus, and on transfer to a new host produces gonorrhœa. We have constantly looked for such a cell, and frequently found a similar type, although in our cases we believe it is an intermediate stage of a non-Neisserian organism. This impression is confirmed by our own experiences in another study, wherein the urine from cases of cystitis and pyelonephritis is cultured. On many occasions a peculiar large monoform cell, about four times the size of a staphylococcal organism, has been grown out, and the organism on culture would appear to defy identification. By repeated subculture and the elapse of one month's time, this large cell would eventually produce what was readily recognized as a Gram-negative organism, frequently coli. Caspar pointed out that this large monoform cell in gonorrhœa may be the factor responsible for recurrence of infection, or relapse after treatment.

Some of the additional cases studied, and not reported in detail here, have provided very use-

ful information. We have found that many cases completely failed to respond to the first course of penicillin and prostatic massage, but responded to the second course; although an occasional case seemed to remain resistant to all forms of therapy. In one patient the penicillin therapy was continued up to five million units because of Vincent's angina. He became free of symptoms in seven days, but the prostatic fluid remained grossly infected throughout, showing over 100 pus cells per high power field. This suggests the possibility of the organism becoming "penicillin resistant".

It was also observed that when penicillin, without prostatic massage, was given for the two-week period the number apparently cured dropped to approximately 10%. This has led us to believe that the prostatic massage twice a week is an essential part of the treatment. Recently we have also decreased the time interval between injections to every three hours.

The desirability of treating these patients on an ambulatory basis is obvious. So far we have treated only two patients with penicillin tablets. The results were satisfactory, but the excessive cost of the tablets renders this form of treatment prohibitive for most patients.

In a few of the failures to penicillin therapy alone, we have used a combination of penicillin intramuscularly, and sulfathiazole with methylene blue parenterally. A synergism between sulfathiazole and penicillin has been described,[5] and more recently a synergistic action between certain dyes and the sulfonamides.[4] In one chronic case which did not respond to penicillin therapy and in which the urethral discharge was due to staphylococci and diphtheroids, the discharge stopped after two doses of sulfathiazole and methylene blue. In another case with the same type of bacteriology, there was no noticeable change after treatment with sulfathiazole and methylene blue.

In the new cases presenting, a circumcision or meatotomy is done as indicated, if we feel that the drainage of the urethral canal is in any way interfered with, or recontamination may be occurring. Urethroscopy is being carried out in most of these cases. It has been observed that although a urethral discharge is present in nearly 80%, the anterior urethra looks perfectly normal in the majority of these cases, and the prostatic urethra is intensely engorged and inflamed. This suggests the possibility that the urethral discharge present may be due to an excessive inflammatory prostatic secretion, and in fact may be a prostatorrhœa rather than a urethritis. It is our impression that in many cases this is so, but as yet we have had an insufficient number of cases for proper evaluation. On this basis one might question the correctness of the diagnosis in those patients who had a previous history of non-specific urethritis. Was it really a urethritis, or was it a prostatitis with excessive prostatic secretion?

We have given up the use of urethral irrigations and pelvic diathermy except in rare cases, because the results of treatment with a two weeks' course of penicillin and prostatic massage is in our experience far superior to any other form of treatment we have used. It should, however, be emphasized that our more recent cases show a somewhat lower percentage of apparent cures than recorded in the first hundred cases studied and reported in this series. The exact significance of this is as yet unknown. It would appear that the number of cases of chronic prostatitis and non-specific urethritis responding to a two-week course of penicillin therapy and prostatic massage is sufficiently large to recommend this as a routine form of treatment.

CONCLUSIONS

1. A study of chronic prostatitis associated with non-specific urethritis has been made. A preliminary report of 100 treated cases is presented.

2. The cases divided themselves into three main groups: (1) those with a previous history of gonorrhœal urethritis; (2) those with a history of a previously diagnosed non-specific urethritis, and (3) those with no previous history of urethritis.

3. A urethral discharge was present in 84 to 91% of the cases in Groups I and II, being the presenting symptom in 70%. It was the presenting symptom in only 21% of the cases in which there was no previous history of urethritis. Urinary frequency, backache, terminal hæmaturia, and vague perineal discomfort were frequent symptoms.

4. Pyuria without symptoms was present in 28% of the group with no previous history of urethritis.

5. Alcoholic and sexual excess are believed to be predisposing factors which lower the resistance of the urethra and prostate, favouring subsequent invasion by organisms.

6. The bacteriology found on culture was staphylococci alone in 55 cases, diphtheroids in 10, and staphylococci in combination with micrococci, streptococci, and trichomonas in 32 cases. Gonococci were found once, and trichomonas vaginalis twice.

7. A diagnosis was made by: (1) the history and symptoms; (2) the presence of a urethral discharge; (3) the three-glass urinalysis, and (4) the examination of the prostatic fluid.

8. Palpation of the prostate is not indicative of the pathology present. Examination of the prostatic fluid is essential.

9. Criteria of "cured", "apparently cured", "improved", and "failure" are defined.

10. Treatment with stilbœsterol, urethral irrigations, sulfonamides, 100,000 units of penicillin, and pelvic diathermy, were all found to give unsatisfactory results.

11. Penicillin, when given in doses of 25,000 units every four hours for 14 days and prostatic massage twice a week resulted in 75% of the cases being "apparently cured", and the remaining 25% were "improved". All were asymptomatic at the completion of treatment. In the new cases presenting the penicillin is given every three hours.

12. Symptomatic improvement occurred on the fifth to the tenth day, usually on the seventh. A decrease in the number of pus cells in the prostatic fluid coincided with the symptomatic improvement.

13. There were six temporary failures or complications in the first 100 cases treated, requiring additional special treatment, such as circumcision, meatotomy, urethral dilatations, etc.

14. In smears of the urethral discharge or prostatic fluid a large monoform cell is frequently seen, which we believe is an intermediate stage of the pathogenic organism present in that particular individual.

15. In further cases studied, many completely failed to respond to the first course of penicillin and prostatic massage, but responded to the second course, although an occasional case continued to remain resistant to all forms of therapy.

16. In some of the temporary failures, penicillin was given intramuscularly, and sulfathiazole with methylene blue given orally. In one case so treated the urethral discharge, which had been present for one month, ceased within twenty-four hours.

17. Urethroscopy has been carried out in a gradually increasing number of this type of case. It is our impression that the anterior urethra is entirely normal in the majority of these patients, though the prostatic urethra is intensely inflamed. It is thought that the urethral discharge present may be due to the prostatitis causing an excessive inflammatory prostatic secretion, rather than to a true urethritis. On this basis the cases which have previously been diagnosed as non-specific urethritis may be open to question.

18. Prostatic massage twice a week is considered to be an essential part of the treatment, as with penicillin alone the number apparently cured dropped to approximately 10%.

The authors wish to thank Dr. Fred Smith, Associate Professor of Bacteriology, McGill University, for the valuable suggestions which he has made in carrying out penicillin therapy.

REFERENCES

1. CASPAR, W. A.: Morphological and cultural behaviour of the gonococcus in the carrier, *Am. J. Syphilis*, **26**: 614, 1942.
2. FARQUHARSON, R. F., GREEY, P. AND TOWNSEND, S. R.: Results of penicillin therapy, *Canad. M. A. J.*, **53**: 1, 1945.
3. HECKEL, N. J. AND STEINMETZ, C. S.: The effect of female sex hormone on the function of the human testis, *J. Urol.*, **46**: 319, 1941.
4. THATCHER, F. S.: Synergistic action between sulfonamides and certain dyes against Gram-negative bacteria, *Science*, **102**: 2640, 1945.
5. UNGAR, J.: Synergistic effect of para-aminobenzoic acid and sulfapyridine on penicillin, *Nature*, **152**: 245, 1943.

CHEST X-RAY SURVEY OF REPATRIATED PRISONERS OF WAR FROM JAPANESE CAMPS*

By A./Surg. Lieut. Cmdr. H. H. W. Brooke, R.C.N.V.R.

THE chests of 1,507 prisoners of war repatriated from Japanese camps have been surveyed by x-ray. These men were all ambulatory. The cot-cases and others obviously requiring medical attention, including a small number singled out by previous chest surveys, had been hospitalized on or before arrival, and are not included. Approximately 100 of the 1,507 had been fortunate enough to have had previous chest films.

The group was quite representative as to nationality, including fairly equal numbers of British and Canadian service personnel including 6 British Army nursing sisters. All but a

* From the Department of Radiology, R.C.N.H., Esquimalt, B.C.

very small non-representative group had been prisoners since December, 1941, held in various camps in Japan or islands under Japanese rule or in occupied China.

The conditions under which these men had to live in these camps and the totally inadequate diet they received throughout their imprisonment are already common knowledge. Many camps had weathered various severe epidemics including diphtheria, typhoid and dysentery. The tasks usually allotted included road building and working underground in mines and in general required strenuous physical activity. All suffered from beriberi, as a general rule, in an advanced stage clinically.

The interval of time between the date of liberation and the chest x-ray examination varied from two weeks, for a small series of 95 cases, to six to eight weeks for the remaining larger number of 1,412. The former small group had been examined at various U.S. Naval Hospital Units in the Pacific Area and their films accompanied the men back to Canada where the latter larger group was surveyed upon arrival.

For convenience and clarity the observations from this film survey will be considered under three sections, with accompanying tables.

THE THORACIC CAGE

Very early in this survey, the conclusion was obvious that in many individuals the chests had a radiographic appearance suggesting that of a much older physiological age group than the chronological age of the men we were actually dealing with would indicate. There was apparent depletion of calcium content of the bony structures, with resultant increase in radiolucency and a coarse appearance of the medullary trabeculæ.

Seventeen or 1.1% were noted to have healing rib fractures. Poor calcium content was the rule in the callus formation, especially in those with "lead-pipe joint" type of union. Two cases with multiple posterior fractures appeared to have entire rib segments missing. One of these had a moderate underlying pleural thickening and the defects could have been the residuum of a previous open-drainage procedure. Associated pleural thickening was noted in one other individual. Another interesting case had had the posterior aspects of the 4th, 5th, 6th, 7th, 8th and 9th ribs fractured in a straight line as if by a blow from a sharp instrument. A portion of the inferior angle of the scapula, also broken off in line with the rib fractures, remained as an ununited fragment.

Multiple shrapnel fragments were noted in two individuals. For the most part, these were in the soft tissues covering the thoracic cage.

PLEURAL AND PULMONARY CHANGES

Difficulty in classification of the various lesions was encountered in the differentiation between activity and inactivity, in some cases with pleural involvement, and in regard to minimal parenchymal shadows. This was enhanced by the fact that multiple projections and follow-up film studies were not available as the men moved rapidly through and out of our hands. This should be kept in mind when Table I is studied.

TABLE I.

PLEURAL AND PULMONARY LESIONS

Classification of lesion	*Number of cases*	*%*	*Total %*
Pulmonary tuberculosis			4.3
a. Questionable minimal	24	1.6	
b. Minimal active	33	2.2	
c. Moderately advanced	7	0.4	
d. Far advanced	2	0.1	
Pneumonia			0.7
a. Lobar	3	0.2	
b. Atypical	7	0.4	
c. With cavitation	1	0.1	
Pleurisy			2.8
2. Active and inactive	36	2.4	
b. With effusion	5	0.4	
Diaphragmatic elevation R	6	0.4	—

Tuberculosis.—Group "a" under Pulmonary Tuberculosis and designated as "questionable minimal", includes all lesions in the upper lung fields which, because of their size and density, were thought to be questionable evidence of disease. Also included in this group were definite minimal-size lesions which were fibrotic in appearance, but not containing calcium and thus of undetermined activity. Groups "b", "c", and "d" need little explanation except to state that the classification used is that of the American Tuberculosis Association. Two of the "minimal active" cases had pleuritis on the same side. Both "far-advanced" cases were of moderate extent but had well outlined cavity formation. The whole group included a total of 66 cases, or 4.3%.

Pneumonia.—The one case listed as "pneumonia with cavitation" presented a cavity with irregular, ragged, clearly defined borders circumscribed by a thin zone of parenchymal consolidation. The cavity measured 2.5 x 3.5 cm.

in diameter, and was located in the right mid chest lateral to the hilar shadow. Etiology was uncertain and undetermined although Friedländer's bacillus or some such unusual pneumonic involvement was considered. The total number of pneumonic cases was 11 (0.7%).

Pleurisy.—Group "a" under Pleurisy includes all cases of pleural involvement showing at least obliteration of the costophrenic angle. Although some cases presented a rather definite picture of inactivity, the greater number were probably active. One case in group "b" had not only rather extensive pleural involvement with effusion but also a perihilar infiltration. This possibly should have been classified under tuberculosis. A second case showed a well encapsulated, oval-shaped mass 7 x 3 cm. of heavy ground-glass density situated with its long axis against and parallel to the mid-portion of the axillary border of the lung. This was thought to be definitely in the interlobar pleural space, possibly to contain homogeneous calcifying material. The contiguous rib segments or soft tissues were not involved. Etiology was not determined. The total number of cases with pleural involvement was 41 (2.8%).

Elevation of diaphragms. — The six cases listed under elevation of the right diaphragm warrant description. Each presented a moderate elevation of the leaf accompanied by a sharply demarcated high dome-like protrusion or digitation into the hemi-thorax. Two of these cases showed the transverse linear markings in the basal segment of the right lung field similar to those described and associated with subdiaphragmatic lesions, probably accentuated interlobular septa. All these may have been residual adhesive pleuritis.

The total number of individuals with active or questionably active pleural or pulmonary disease was 118, or 7.8% of the group. This figure does not include the six cases with abnormal right diaphragms.

CARDIO-VASCULAR CONSIDERATIONS

Roesler has described in association with beriberi a marked enlargement of the right heart affecting especially the conus and the intrapericardial portion of the pulmonary artery, but as a rule without left-sided enlargement. A pericardial effusion may be present. A well advanced case is characterized by globular enlargement, marked bulging of the right lower border and the pulmonary artery and conus, also accompanied by broadening of the right vascular or superior vena cava shadow. Usually there is no enlargement of the primary branches of the pulmonary artery nor congestive failure in the lungs. Under proper treatment, regression of the heart size is generally unquestionable and rapid.

Cardiac mensuration.—In this entire series of 1,507 cases, only three individuals were found with a cardio-thoracic index of over 0.5, all of whom had an aortic rather than a mitral or globular configuration.

With a view to determine any characteristic cardiac enlargement, measurements were carried out on 435 chest films. These included the 95 cases who had had their films made within two weeks after liberation (Group I). The remaining 340 cases were taken after an interval of six to eight weeks subsequent to liberation (Group II). All are listed in Table II with their corresponding average cardiac measurements.

TABLE II.

CARDIAC MENSURATION

Number of cases	*Type of case*	*Average period of liberation*	*Average broad cardiac diameter*	*Average transverse cardiac diameter*
95	P.O.W.'s	2 wks. (Group I)	10.9 cm.	13.1 cm.
340	P.O.W.'s	6 to 8 wks. (Group II)	11.3 cm.	13.0 cm.
100	"Normal" dischargees	—	11.5 cm.	12.7 cm.

It will be noted that there is little variation in the average cardiac measurements of the two groups. In comparing these figures with those derived from 100 routine service discharge chest films of presumably healthy individuals (which, as it will be explained later, were used as "normal" standards), it will be noted that the average broad diameter of the cardiac shadow was 0.2 to 0.5 cm. *greater* in the "normals" than in the repatriates. The standard transverse diameter averaged 0.6 to 0.7 cm. *smaller*. Thus these results would seem to indicate no gross variations in cardiac size within these groups in comparison with one another nor in comparison with "normal" individuals.

A similar impression was also gained from a small group of 36 repatriates who had both Group I and Group II films. Here again, as illustrated in Table III, no definite change was demonstrated in cardiac mensuration, and certainly no detectable gross enlargement was observed.

TABLE III.

GROUP I AND II CASES

Number of cases	*Group*	*Broad cardiac diameter*	*Transverse cardiac diameter*	*Remarks on configuration*
36	Group I	10.71 cm. (Average)	13.1 cm.	
36 Same cases	Group II	10.91 cm. (Average)	13.2 "	
1	Group I	11.2 cm.	12.8 "	Globular shape
Same case	Group II	11.0 "	12.6 "	No change
1	Group I	12.8 "	15.0 "	Globular shape
Same case	Group II	11.8 "	14.0 "	Much less globular
1	Group I	11.8 "	12.8 "	Globular shape
Same case	Group II	11.6 "	13.2 "	Less globular

It may be noted that the figures used as "normal" standards do not agree numerically with those given by Roesler of 9.8 cm. and 12.2 cm. respectively for the broad and the transverse diameters. However, his measurements were derived apparently from the orthodiagram. Fluoroscopy of these repatriates was not practicable, thus all measurements for comparison were carried out on the tele-roentgenogram made under conditions common to the several groups. For these reasons and the factor of personal variation in mensuration, only the broad and transverse diameters were used. A more accurate comparison was thought to be procured by using as a normal standard the average measurements from routine discharge chest films personnel of 100 service personnel of similar age.

Cardiac configuration. — Further, with reference to Roesler's description of a "beriberi heart", attention was given to the configuration of the cardiac silhouette in the 435 cases in Groups I and II. Evident cardiac enlargement and changes in configuration were not apparent in the majority of Group I. Available information on these cases during the two weeks between liberation and x-ray examination would indicate that although the diet was greatly improved, it did not contain consistent therapeutic doses of vitamins.

Prominence of the pulmonary artery and the conus was thought to be present in perhaps 20% of the cases. Five per cent of Group II showed a globular shape of the heart but no definite cardiac enlargement. Eight, or 13%, of Group I showed a more characteristic globular configuration but here again no definite hypertrophy of the cardiac shadow. Three of these 8 cases had both Group I and II films, and thus comparison was possible as illustrated in Table III. Two of these three cases showed a less globular appearance after the interval of 4 to 6 weeks. All three cases presented a diminution in the measured broad diameter, one of 1 cm., the other two of only a few millimetres. But these changes are not considered great enough to be labelled as true characteristic variations. As is pointed out above, this was the conclusion drawn from the 36 cases in both film groups.

As a generalization on the entire group, the repatriated prisoners of war did not show in comparison with a control group of "normal" dischargees any notable variations despite their obvious state of beriberi. If there has been any characteristic, radiographic change in the hearts of these cases, up to 8 weeks after liberation, it has been an improvement in cardiac shape or tone rather than actual variation in size.

With reference to the various components of the aortic shadow and the pulmonary vascular bed, no consistent variation was demonstrated.

SUMMARY

1. The chest films of 1,507 Canadian and British prisoners of war repatriated from Japanese camps have been reviewed. All films were taken within eight weeks after liberation, while the repatriates were still in a state of malnutrition with mild to severe beriberi.

2. Only 118 cases (7.8%) were found to be suffering from active or questionably active pleural or pulmonary disease, or both.

3. Skeletal calcium depletion was common. Seventeen cases (1.1%) were found to have healing rib fractures.

4. Only three cases (0.2%) had a cardiothoracic index of over 0.5, each with an *aortic* type of cardiac configuration. Four hundred and thirty-five analyzed by mensuration did not reveal any definite or characteristic cardiac enlargement. Beriberi heart changes as described by Roesler were not obvious.

My thanks are due to Dr. Carleton B. Peirce for advice and assistance in the preparation of this paper.

REFERENCE

1. ROESLER, H.: Clinical Roentgenology of the Cardiovascular System, Charles C. Thomas, Springfield, Ill., 1943.

What can a sick man say, but that he is sick?—Samuel Johnson.

CIRCULATION FAILURE IN HUNGER ŒDEMA

By E. Lopes Cardozo and P. Eggink, M.D.

Gouda, Holland

IT was stated in a newspaper (*Daily Telegraph*, May 8, 1945) that, "Many people who had expected to see evidence of starvation among the residents of Utrecht, were agreeably surprised to see them so healthy looking." Still, about 75% of our patients in the three months prior to writing came to us because they were suffering from malnutrition. Only some of them showed œdema. For instance, one saw hardly any œdema in children, women and younger men. It was mostly encountered in men over forty. The œdema starts at the feet, as in cardiac œdema, or under the eyes as in glomerular nephritis. In our cases the former type was prevalent.

These patients show the following clinical picture: they complain of weakness and excessive hunger throughout the day. As a matter of fact, when you feed them, they will eat all day (if not in too bad condition). They

Age (all males)	*Length*	*Weight*	*Pulse*	*Blood pressure*	*Circulation time Normal 12 to 17 seconds*	*Breathkeeping power after inspiration, normal 40 seconds. After expiration, normal 20 seconds*	*Blood sedimentation*	*Hæmoglobin (normal 85 to 95%)*	*Total protein (70 to 75%)*	*Albumin (50 to 55%)*	*Globulin (20 to 25%)*	*Urea (300 to 400 mgr./L.)*	*Œdema*	*Diameter thorax/diameter heart Normal > 2*	*Basal metabolic rate*	*Electrocardiogram Q-T. (Pulse rate 45 to 55: 0.38-0.51 sec.)*	*Remarks*
57			48	130/90	25.0				53.9	39.1	14.8		+			0.85	
59	165	49	68	90/70	22.0	30/25	5	62	47.8	36.5	11.3		++			0.40	
47	176	53	48	120/95	20.5	40	3	75	66.5	40.3	26.2	340	+	2.0		0.47	
68	178	64	56	130/90	22.0	45	50	72	53.0	37.4	15.6	326	+			0.48	
61			48	75/50	20.0	47/22	2	71	53.0	42.1	10.9	498	++	2.6		0.44	
50	172	86	42	150/90	20.0	21/20	13	70	53.4	38.6	14.8	442	++			0.50	After loss of œdema, weight 66 kg.
54	164	59	52	125/70	18.0		6	84	52.5	39.0	13.5		+				
59	171	54	80	150/90	24.0	30/18	17	59	58.8	39.0	19.8	393	++				
65	172	57	76	120/80	28.0	28/28	88	59	58.8	31.2	27.6	310	++			0.36	Cause of high blood sedimentation?
59	158	47	68	105/90	20.0	30	13	77	66.5	40.3	26.2	315	+				
67			56	135/90	31.0	45	65	58				710	++			0.40	High blood sedimentation caused by phlegmon.
49			40	110/80	19.5								++				
51	181	61	56	105/80	26.0	60							++				
54			76	100/85	28.5		40	60					++				Cause of high blood sedimentation?
53	181	75	48	130/85	29.0	55	0	72	67.6	51.5	16.1	332	±			0.44	
44	180	49	40	110/90	23.0	40/30	2	83					+		–40		
60	167	62	68	180/120	37.0	30	95	64				314	+				
63	179	57	70	135/80	20.0	63	3	75				520	+		–26		
61	175	69	70	125/80	19.0	35	26	44				302	++				Complicated by pernicious anæmia.
50	173	69	40	120/75	32.0	53	3	84				320	+		–40		
74	163	57	60	95/75	25.0	35/35	8	80				150	+				
65	162	51	46	170/100	31.0							398	+		–27		
40	156	55	52	90/60	16.0	40	7	71	45.1	34.9	10.2		++	1.8		0.48	
67	164	51	48	115/55	16.0	20/15	9	57	61.3	44.2	17.1	400	+	1.9		0.54	
46	167	57	52	130/90	12.0		4	85	59.0	43.4	15.6	269	++	1.94		0.40	
36	170	67	48	160/100	15.0	33/24	35	70	59.3	40.0	19.5	368	++			0.44	Chronic nephritis?
47			56	135/90	17.0		14	68	55.0	34.9	20.1	280	++				
48	172	53	52	105/80	15.0	55/26	55	95	57.3	40.3	17.0	233	++	2.3			Cause of high blood sedimentation?
54			58	110	17.0	27/23	39	62				400	++	1.96			Died of pulmonary tuberculosis.
59	157	43	56	105/70	20.0		2	78	56.4	39.0	27.4	672	—	2.0		0.40	Succumbed.
67	171	58	54	130/60	20.0	25	34	77				320	—				
41	172	61	36	130/70	25.0	55	2	80				191	—		–32		
50	178	63	56	120/80	27.0	55/33	2	67				120	—				
27	185	65	40	120/80	17.5		12	84	71.1	52.0	19.1	470	—			0.56	

are slow in movements and thought, they feel cold, they look pale (ash colour) like patients in shock, and at the same time they are cyanotic (nails and lips). The most remarkable features are: a very slow pulse rate between 40 and 50, a low blood pressure, systolic under 100 and showing a low pulse pressure.

We were especially interested in the condition of the circulation and therefore we tested the circulation time. This is the time that is needed to transport an injected material (we use 10% magnesium sulphate) from the arm to the tongue. Magnesium sulphate causes a hot sensation on the tongue that cannot be missed. Normally this time ranges from 12 to 17 seconds. In most (76%) of our patients with hunger œdema the circulation time was above 20, in the more serious cases over 30 seconds.

In several cases we could state that the circulation time was lengthened even before the œdema had developed. So the measurement of the circulation time is of diagnostic value. The circulation time is lengthened in decompensated heart failure; but our patients did not show signs of cardiac decompensation. There was no venous engorgement and the breath holding power was not diminished. Most of the patients were able to hold their breath for more than 30 seconds and a few much longer.

We also made electrocardiograms of nearly all the cases. These electrocardiograms did not show any signs of coronary occlusion, but they revealed besides the slow heart rate, low voltages as in myxœdema. However x-rays showed that the hearts were not enlarged as in myxœdema. As a matter of fact, there were many features resembling the hypothyroid state, in which disease the circulation time is lengthened too, and there were the complaints of coldness and slowness and often of impotency. In five cases we measured the basal metabolic rate; in all cases we got low figures ranging from minus 26 to minus 40%. (However these figures cannot be exact as the œdema interferes with the true weight, which hinders the calculation to some extent). Still we do not think we were dealing with myxœdema. This seemed to be a true œdema, sometimes associated with ascites and hydrothorax; also, in myxœdema, the heart is enlarged, whereas we found the heart to be normal in size.

We think the cause of the low metabolic rate in these cases is not insufficient function of the thyroid gland, but rather glycogen deprivation of the organism; there is no coal left to be burned and therefore the stove is cold. The organism functions in the most economical way by lowering the metabolism. As a matter of fact the patients do not work and hardly move from bed. They stay in bed all day and have not even the energy to fetch the food they can get.

The following chemical features were found: the total protein content of the serum was lowered to some extent, mainly the result of a diminished albumin content. Still the drop in albumin did in no case reach such a low level that the œdema could be accounted for thereby, as is the case in the nephrotic type of nephritis. The lowest albumin percentage in our series was 3.1; on an average it was 4.0, whereas the normal percentage is 5.0. In nephrosis, figures under 2.0 are met with. Still the diminished protein content is a constant symptom, which deserves attention as to the therapy (plasma).

The hæmoglobin content, as a rule, was diminished to 60 to 70%. When considering this, we must take into account that there exists hæmoconcentration by loss of plasma-water towards the tissue spaces. When the plasma volume is restored there will result a further drop of the hæmoglobin content.

The blood urea concentration was slightly increased, although most patients complained of polyuria. The cause of this urea increase is probably extrarenal and may in part be caused by body protein consumption.

The blood sedimentation rate was normal, which agrees with the normal globulin and fibrinogen contents of the plasma.

Can we now explain how the œdema comes into existence? We do not think we can. The diminished albumin content is one factor. Secondly, the hæmostasis by retarded circulation in capillaries favours the escape of water towards the tissues. French authors[1] demonstrated an elevation of the alkaline reserve, so that a shift towards the alkaline and sodium retention may be factors of importance.

As a whole, the cause of hunger œdema is unexplained. The therapy should consist of calorie- and protein-rich diet. However, it is a pity that in the serious cases this is hampered by persistent diarrhœa of unknown origin. Especially in these cases intravenous plasma therapy should be of great value. In the past we had not enough plasma to try this out.

SUMMARY

Of 29 cases of hunger œdema the arm-tongue circulation time has been lengthened in 22 cases (76%). Besides, the circulation time was lengthened in 4 out of 5 cases that suffered from malnutrition without œdema (pre-œdemous state). Retarded circulation, slow heart rate and low blood pressure are responsible for a slower flowing of the blood and hypoxemia in the capillaries. Together with a moderate fall of the serum albumin content, these factors contribute to the development of œdema.

REFERENCE

1. NICAUD, ROUAULT AND FUCHS: *Bull. et Mém. des Hop. de Paris*, 58: 307, 1942.

JAUNDICE IN INFANCY*

By C. E. Snelling, M.B.

Toronto

JAUNDICE results from a staining of the skin and mucous membranes with bilirubin, and becomes manifest when the plasma bilirubin reaches 2.0 mgm. %. Bilirubin is formed from hæmoglobin by the reticulo-endothelial cells and is excreted from the blood stream by the cells in the liver cords to the bile canaliculi, where it is drained to the intestinal tract. Increased plasma bilirubin or jaundice can result from increased destruction of hæmoglobin or interference with the excretion of bilirubin or both. Jaundice resulting from these two types of reaction are known respectively as hæmolytic and obstructive. The van den Bergh reaction distinguishes these two types, being indirect in the former and direct in the latter.

The main types of jaundice seen in infancy are (*a*) physiological; (*b*) secondary to infection; (*c*) obstruction of bile ducts; (*d*) hæmolytic anæmia of the newborn.

Physiological jaundice.—Practically all infants during the first week show some elevation of the serum bilirubin. Cord blood shows an elevation and this rises for 3 to 4 days and usually then begins to fall. Icterus is noted when the serum bilirubin goes to more than 2 mgm. %. It is usually observed in about 30% of cases but may be found in a much higher number if the infant is observed closely under good daylight illumination. Jaundice usually appears on the second day and increases to one week, when it begins to fade. It tends to be more pronounced and prolonged in premature babies.

Many studies have been carried out on the etiology of icterus neonatorum. The high red blood count at birth with the subsequent drop is undoubtedly related to the production of jaundice. The high red count at birth is caused by the relatively poor oxygen tension to which fetal blood is exposed. After birth, when aeration of the lungs takes place the oxygen tension is improved and the relative polycythæmia is not necessary. The function of excretion by the liver is also a factor in the production of icterus neonatorum. This is borne out by the gradual reduction in red count, the tendency to disappearance of icterus at one week and more prolonged icterus in the premature, and to the fact that cord blood shows elevated serum bilirubin.

There are no unusual symptoms other than jaundice. The stools contain urobilin and the urine does not contain bile. The van den Bergh reaction is always indirect and may go up to 15 mgm. % At the height of the jaundice one may observe a somewhat drowsy state in the infant and a tendency to feed poorly. As this is a normal phenomenon it is self-limited. Occasionally the infant is improved by the use of a hypodermoclysis at the height of the jaundice.

Secondary to infection.—Jaundice in the newborn secondary to infection, is due to sepsis or syphilis. That due to sepsis comes on usually after the fourth day and is associated with the other signs of sepsis. The portal of entry is frequently the umbilicus with a spread to the liver. The liver is enlarged. The veins in the skin of the abdomen are usually prominent. There is usually distension and one is faced with a very ill child. Blood culture and metastatic foci of infection settle the diagnosis and determine the infecting organism. The treatment is that of the sepsis which may respond to the sulfa drugs or penicillin.

Syphilis in the newborn can and does frequently simulate erythroblastosis fœtalis in all its aspects. It is not a very common cause of jaundice in the newborn. In the last few years we have had a number of congenital lues cases in the hospital but jaundice was not a

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From the Department of Pædiatrics, University of Toronto and the Hospital for Sick Children, under the direction of Alan Brown, M.D., F.R.C.P.(Lond.)

feature of any of these. If the mother's Wassermann is not known in the presence of jaundice in the newborn associated with enlargement of the liver and spleen, the Wassermann of the infant should be determined as well as x-rays of the long bones. The treatment here is that of lues.

Obstruction of bile ducts.—Malformations of the biliary tract are a not uncommon cause of jaundice in infancy. The etiology of this condition has not been clearly established. In some it is probably a congenital defect, being an error in formation. In others the course suggests an inflammatory origin either due to secondary infection of the biliary tract or from irritation caused by inspissated bile and biliary secretions formed before birth. The obstruction to the outflow of bile may be due in the common bile duct, or the hepatic ducts, or may be a diffuse biliary fibrosis. These patients are jaundiced but the jaundice does not usually attract attention till after the second week. The stools have the normal meconium colour, then later have a whitish to chalky appearance depending on the completeness of the biliary obstruction. In those cases in which obstruction is complete the stools are white and give a negative bile test, but there may be some staining of the surface by the pigment which is present in all body secretions. The urine is dark in colour and gives a positive test for bile. The liver is usually enlarged and the spleen may be as well. The van den Bergh gives a direct positive test and may go quite high, up to 70 mgm. %. This condition usually interferes with nutrition but in some cases which show complete biliary obstruction the child has thrived unusually well. Most of them develop dystrophy and infection and succumb with very little evidence of resistance on their part.

When this condition is diagnosed, laparotomy should be done. Occasionally the situation is such that it lends itself to anastomosing some part of the functioning biliary tract into the intestine and providing a route for the outflow of bile. Holmes, who recorded 100 cases, stated that 20% hold a reasonable possibility of cure by operation. Ladd has a number of successes on record. Because of the lack of bile secretion into the intestinal tract the fat soluble vitamins A, D and K may be unabsorbed. Before operation vitamin K should be given parenterally.

Inspissated bile or some other form of temporary obstruction occurs occasionally. We have had three cases in which all the signs suggested obstruction of the outflow of bile with occasionally a very slight trace of pigment in the stools. In these cases milk of magnesia was given before the feedings and bile salts with the feeding. In addition medical drainage of the gall bladder by passing a duodenal tube and injecting 20% magnesium sulphate was used. In all three cases, after these procedures, colour gradually began to appear in the stools and the jaundice disappeared. This is a form of therapy that should be tried in every case where atresia of bile ducts is suspected but not definitely established.

Erythroblastosis fetalis.—Erythroblastosis fetalis is a term used to describe several conditions which have unlike clinical manifestations but seem to have a common pathological background. These are certain types of intra-uterine fetal death, congenital fetal hydrops, icterus gravis neonatorum and certain cases of congenital anæmia. The outstanding features of all of these are fetal types of blood formation, erythroblastosis, or the presence of an abnormal number of nucleated red cells in the circulation, anæmia, jaundice, familial tendency and œdema of the body tissues. Recent investigation has added that it is probably associated with immune factors in the mother's blood, namely the Rh factor.

Fetal hydrops and icterus gravis have been known for some time. In 1910 Schridde suggested that icterus gravis and fetal hydrops were related conditions. In 1912 Rautman gave the name erythroblastosis to the symptom complex. Blackfan, Diamond and Baty in 1932 observed the association of these two with congenital anæmia. Levine and Wiener and others in the last 5 years have shown an association between all of these conditions and the Rh factor in the blood of the father, mother and fetus.

Intra-uterine death of the fetus and fetal hydrops are problems of the obstetrician. Occasionally cases of fetal hydrops survive long enough to be seen by the pædiatrician but usually they die very shortly after birth.

Icterus gravis is the most frequent of all of the types of erythroblastosis fetalis. Fetal hydrops occurs about 1 in 1,500 deliveries whereas icterus gravis occurs in about 1 in 500.

Icterus gravis has been reported in all races and both sexes.

The clinical manifestations of icterus gravis are (1) jaundice which commences at or near birth and increases to a very intense degree; (2) hæmolytic anæmia which progresses; (3) numerous circulating erythroblasts; (4) enlargement of the liver and spleen; (5) drowsiness and convulsions; (6) hæmorrhagic tendency occasionally also with purpura; (7) bile in the urine; (8) normal coloured stools; (9) direct van den Bergh; (10) fatal termination in a large proportion.

In the history one finds that usually there has been a normal child or children preceding the case and then all succeeding pregnancies show one or other of the types of erythroblastosis fetalis. Another feature often observed is the history of a placenta being larger than usual and a yellow staining of the vernix. The jaundice, which starts very early, may be so marked that one does not appreciate the pallor. The spleen and liver are invariably enlarged. Petechial hæmorrhages or gross hæmorrhage are not uncommon. The blood picture shows a macrocytic hyperchromic anæmia. The hæmoglobin is higher than the red blood count would warrant. The red count varies from 3.5 million down to as low as 400,000. The number of nucleated red cells varies, in some not being very high, in others 1 in 5 cells is an erythroblast. Reticulocytes, polychromasia and stippling are also present. This hyperplastic picture continues in dwindling degree in those cases which survive for a week or two when a hypoplastic phase sets in which may last for from three weeks to many months. It is this stage which in some of the originally milder untreated cases has been diagnosed congenital anæmia. If these patients are carried by the use of transfusion through the hypoplastic phase their blood production comes back to normal function.

The white cells are often increased and there may be some immaturity. The platelets are decreased in certain cases, particularly those which have a high erythroblast count and these are usually associated with petechial hæmorrhages and purpura. The prothrombin of the blood is often diminished. The jaundice in this condition may go to an extreme degree and is higher than that seen with complete atresia of the bile ducts. The intensity of the jaundice has no bearing on the prognosis. The van den Bergh is usually direct later, though it may be indirect early. The urine contains bilirubin and the stools are not acholic. The reason for this can be brought out by the pathology. Extreme drowsiness is common and occasionally there are convulsions.

In many cases a fatal termination ensues in the first 24 hours. In those that survive, about 15% are mental defectives.

Pathology

The pathological changes are varied but all those which may result from an extreme form of hæmolytic change in the fetus and newborn child. Extra-medullary hæmatopoiesis in an extreme degree is found. This is largely centred in the liver and spleen but may be present to some extent in other organs. The liver of the full term child with erythroblastosis is almost the exact duplicate of the fetal picture seen at three or four months gestation. The liver in the gross is enlarged. In addition to the diffuse areas of hæmatopoiesis in the liver there are frequently plugs of inspissated bile obstructing the liver cords. This is probably due to the tremendous amount of bilirubin being formed from the hæmolysis of the blood. The extra-medullary hæmatopoiesis is an attempt to keep up the production of blood to replace the cells being destroyed. There is also splenomegaly. Icteric staining of many tissues is present. Usually with intense jaundice due to other causes, there is no staining of the brain. In this condition however there is frequently a yellow staining of the basal nuclei which is known by the term "kernicterus". This kernicterus is believed to be due to a settling out of the bilirubin in the basal nuclei which have undergone some degeneration as a result of the extreme anæmia, toxæmia or jaundice, or some unknown factor.

Hæmorrhages from various sites are not uncommon.

All these changes can be attributed to an extreme hæmolytic process combined with an attempt to replace the blood.

Differential diagnosis.—In the differential diagnosis syphilis and sepsis are the two most difficult points. Congenital lues can simulate this condition in almost every respect. I recall one of the first cases I saw which was presented as a typical case with the jaundice, anæmia, large liver and spleen, erythroblasts and œdema; later it turned out to be a congenital luetic. Negative Wassermann reactions in the mother

and x-rays of the long bones help to rule out lues. Sepsis usually develops later and there are other signs to be found.

Physiological icterus may cause some concern but an examination of the blood should settle the diagnosis. Atresia of the bile ducts, hæmorrhagic disease of the newborn, congenital heart disease and congenital acholuric jaundice, all may simulate the condition.

Etiology.—In 90% of the cases of erythroblastosis it has been shown that the father and offspring are Rh+ and the mother Rh−. In many of these, Rh antibodies have been found in the mother's blood. In others it can be demonstrated by a blocking reaction used by Wiener. In the 10% which do not fall into the usual pattern, *viz.*, father Rh+, fetus Rh+, mother Rh−, it can be shown that there is an iso-immunization reaction in the mother to some factor which is different in her blood from that of the fetus and father. Usually it has to do with the Rh factor. Recently Porter recorded cases in which it was due to an iso-immunization to the A or B factor in the blood. We have one case in which the mother was Rh+, the child and father Rh− and also one case of œdema and ascites in the newborn in which the mother showed anti-B immune bodies up to a dilution of 1 in 1,280, whereas the usual is about 1 in 64.

The Rh factor is a dominant inherited characteristic. If we designate Rh as Rh+, and rh as Rh−, then each individual falls into one of three classes, either homozygos Rh Rh, heterozygos Rh rh, or homozygos rh rh. The importance of this is that if a homozygos Rh Rh father marries a homozygos rh mother, all the children will be Rh+. If a heterozygos Rh rh father marries an rh rh mother, over a sufficiently large series 50% of the children will be Rh− and 50% Rh+. This is important in giving a prognosis for future pregnancies.

In the population at large 85% are Rh+ and 15% are Rh−. If the classical combination were all that is necessary erythroblastosis should be present more frequently than it is because such a combination is bound to be present in one marriage in 15, and as stated before it occurs about once in 400 pregnancies. Therefore there is some other factor which has to do with the cause of iso-immunization in some women and not in others. Obviously there is a relation between the Rh and other similar factors in the blood and this condition. Sex of offspring, age, previous health and race of parents have no relation to the condition. This condition has a familial occurrence and is rare in the first pregnancy. Once the condition has been seen in a family however, most of the succeeding pregnancies are likely to show some manifestation.

Prophylaxis and Treatment

Prophylaxis is essentially an obstetrical problem. It is extremely important to be absolutely certain of the diagnosis in the first instance as this information is of such consequence to the family. Future pregnancies should be contracted on the understanding that trouble is almost certain. If the father is homozygos Rh then future pregnancies are certain to be associated with incompatibility. With a heterozygos Rh father then, theoretically 50% of his offspring will be all right. The question of artificial insemination is one to be considered. A question which is of some concern is what will be the end result of the giving of transfusions to girls in infancy and childhood. No doubt many of the Rh− group will become iso-immunized to Rh+ blood during childhood. This may account for what appears to be a greater incidence of erythroblastosis fetalis now, over a decade or two ago.

The treatment is transfusion. This should be given as soon as possible. Because the condition is probably due to the passage of immune bodies from the mother to the child it has been advocated that the early transfusions should be Rh−. There is some difference of opinion regarding the necessity of this. In our experience with some of our previous recoveries checking back on the donors has shown that Rh+ blood had been used. We make it a rule to transfuse as often as is necessary to keep the blood above 60% hgb. Sahli. In the first day this may take two transfusions, then as time goes on the interval between transfusions becomes longer. In addition to this, calcium gluconate is given in those extremely jaundiced cases. Liver extract is given intramuscularly for a period of two weeks. After the acute phase is over, when the blood has taken on the hypoplastic phase, transfusions are necessary at longer and longer intervals.

Using this treatment with transfusions, and taking no care regarding the Rh factor in the five years from 1936 to 1941, we had the following results: there were 46 cases of icterus gravis,

of which 28 were cured and 16 died within 24 hours of admission; 6 of these died before any treatment was given; the other 10 died shortly after the first transfusion. One death occurred in a case which survived more than 24 hours, but was due to another intercurrent condition, as the erythroblastosis had apparently been overcome. Diamond reported a mortality of 7% when those which die in the first day are excluded. Of the 28 recoveries in our series there are 4 which I personally know to be mentally defective.

67 College St.

TREATMENT WITH VITAMIN B OF A SPECIAL TYPE OF VESICAL ATONY*

By Norman W. Roome, M.D., M.Sc.

Toronto

IT is well known that the urinary bladder may become atonic (or hypotonic) from acquired nerve lesions. For example, it may be the earliest area demonstrably affected by tabes dorsalis. Obviously a peripheral, as well as central, neuritis, may produce impairment of bladder function. This was suggested recently by Bowen and Kutzman,[1] who stated that many of their series of diabetic women who were unable to empty their bladders, had diabetic neuritis elsewhere, "so that this failure might have had a neurogenic basis".

That peripheral neuritis may be caused by deficiency of vitamin B is also well established. The current opinion[2] is that the polyneuritis of pregnancy, of diabetes, and of alcoholism, and that occurring after severe infections, are all due to such deficiency. Many other factors contribute or predispose, as outlined by Jolliffe and Smith[3] and many others. Lack of thiamin chloride (B_1) appears most important, and in many instances[4] thiamin is effective in the treatment of such neuritis when given alone. But since riboflavin (B_2), and possibly other members of the B group, are also concerned with similar metabolic processes, it may be better, as suggested by Strauss,[2] to use a suitable diet and mixed B vitamins (B-complex) as treatment. Failures of treatment of diabetic neuritis have been reported,[5] and such failures have been attributed[6] to the irreversible character which the nerve lesions may assume in long-standing chronic deficiencies.

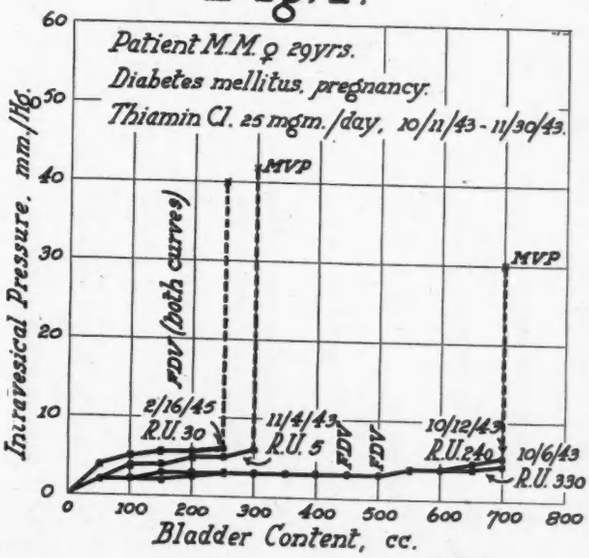
In each of the cases to be described, there was a vesical atony of various degrees of severity; there was an apparently adequate cause of vitamin B deficiency: and there was prompt improvement, both of general health and of the bladder function, on the administration of thiamin or B-complex.

CASE 1

M.M., a married woman of 29 years, was known to be a severe diabetic for 17 years, and had been taking insulin for 16 years. She became pregnant, being due August 21, 1943. On August 5, she was unable to urinate. She was hospitalized and labour induced. This was followed by pneumonia, and on recovery, she remained unable to void. On cystoscopy, there was a "huge quantity" of residual urine, and a very marked pyuria. An indwelling catheter was followed by subsidence of fever, and she was discharged from the hospital with a residual urine of 30 c.c. Bladder irrigations were continued daily, but she did not do well, fever and straining to void returning.

The patient was then admitted to the Toronto Western Hospital two months after the onset of the bladder symptoms. On October 6 there was a residual urine (RU) of 330 c.c. and cystometry (see Fig. 1) showed a

Fig. 1.



subnormal intravesical pressure curve, with lowered voluntary pressure (MVP) and a "shift to the right" of the first sensation of desire to void (FDV). Treatment by indwelling catheter and tidal irrigation resulted in only slight improvement in six days, the RU being 240 c.c., and the pressure curve, FDV, and MVP, essentially unchanged (see Fig. 1).

Thiamin chloride, 25 mgm. daily, was then given intramuscularly. The response was spectacular. The RU fell to 30 c.c. in five days, and she was discharged from the hospital, with no bladder complaints, on the sixth day of treatment. Cystometric examination was made after 23 days of treatment with thiamin (see Fig. 1). At this time the RU, pressure curve, FDV, and MVP, had returned to within normal limits.

There has been no recurrence of the bladder problem, and a fourth cystometrogram on February 16, 1945, showed maintenance of normal bladder function except

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that the RU was 30 c.c. at this time (see Fig. 1). She has continued on B-complex by mouth, at intervals. The urine has remained nearly, but never completely, free of cells during this period.

Other evidences of polyneuritis were present at the time of the first examination, such as absent knee jerks, tender calf muscles, and hypæsthesia of the lower extremities. These changes have also improved, the most remarkable change being recovery of knee jerks, which were known to have been absent, whenever tested, for ten to twelve years.

CASE 2

A.R., a sales manager of 45 years, a chronic alcoholic, was admitted to the Toronto Western Hospital on May 31, 1943, complaining of pains in the legs and abdomen, frequency and nocturia 2 x, burning on urination, and the passage of blood and pus in the urine. On admission, the temperature was 104° F., the RU 90 c.c., and the cystometric examination (see Fig. 2) showed pressures within the normal range, but with diminished sensation (FDV shifted to the right). These findings

Fig. 2.

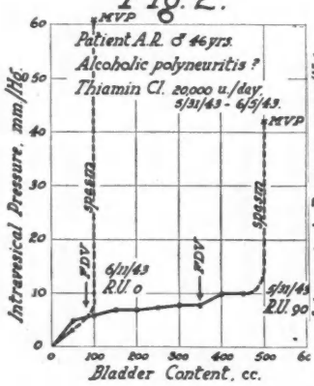
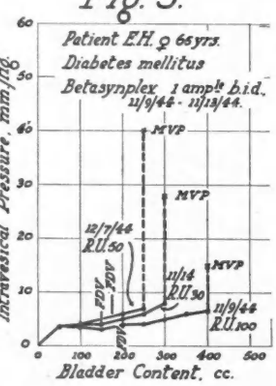


Fig. 3.



indicate, when the severity of the infection is considered, an atonic bladder. Sixty mgm. of thiamin chloride per day, and small doses of sulfathiazole, were given. The temperature gradually fell to normal, and he left the hospital six days after admission. Five days later, on June 11, he stated that he had no urinary complaints except slight frequency and nocturia 1 x, which he assigned to insomnia. Cystometry attempted on this date was complicated by spasm at 100 c.c. (see Fig. 2), but the curve is obviously much altered from that found previously, and the hypertony found represents a more normal response to infection. Cystoscopy on July 2 showed no vesical lesion and no obstruction: the urine was free of cells and sterile to culture. A chronic prostatitis, possibly the source of infection of the atonic bladder, was subsequently treated. He has not been further examined, but states that he has continued intermittently on B-complex tablets, and that he has had no recurrence of any bladder symptoms, nor of the pains of which he originally complained.

CASE 3

E.H., a housewife of 65 years, a moderately severe diabetic, was first seen at the Toronto Western Hospital on November 8, 1944. She complained of frequency, and of straining to pass urine, for three months, accompanied by hæmaturia at first, and with urgency at times. Physical examination showed multiple neurological changes, and a mild cystocele and urethrocele; cystometric study (see Fig. 3) showed a RU of 100 c.c., and a reduced MVP, with a slightly flattened pressure curve and a normal FDV and capacity. Treatment with B-complex in large doses intramuscularly for three days, and continued by smaller doses by mouth, was followed by marked subjective improvement and considerable improvement in bladder function. On the fourth day of treatment, the RU had decreased to 30 c.c., the MVP had approximately doubled, the pressure curve had improved, FDV occurred earlier, and the capacity had lessened to 300 c.c. (see Fig. 3). At the third examination on December 7, 1944, there was further improvement of the MVP, and although the RU remained at 50 c.c., the bladder function was otherwise within the normal range. (It is felt that the residual urine may be due to the cystocele present in this patient.) At this time, the abnormalities of the peripheral reflexes had also diminished, and the tongue, which had been reddened and atrophic, appeared nearly normal.

DISCUSSION

The three patients described each suffered from a polyneuritis, presumably nutritional and due to avitaminosis B. Case 1 was diabetic and pregnant, and later suffered from infection (pneumonia and urinary tract); Case 2 gave a history of alcoholism; Case 3 was diabetic. These are adequate causes for B deficiency, and the severity of the bladder involvement in Case 1 may be due to the superimposition of the several factors mentioned while the less severe changes in Cases 2 and 3 resulted largely from a single etiological factor.

Each case showed prompt and marked improvement, both subjective and objective, on administration of thiamin chloride or B-complex. Included in this improvement was a rapid and well defined change in the bladder function, as shown by cystometry. Hence it appears that the hypotonic bladders in these cases were due to avitaminosis B., *i.e.*, part of the picture of polyneuritis. To be more specific, because two of the cases showed marked improvement when treated with thiamin chloride alone, the defects were probably due to athiaminosis.

Nothing contained in this paper should be construed as a recommendation of vitamin B in the usual neurogenic atonic bladders. The cases described are probably examples of a special type of vesical atony, due to the neuritis of vitamin B deficiency, and hence responding to the specific therapy for this deficiency.

It is recommended, however, that such therapy be more widely considered in the management of the atonic bladder occurring in diabetics and in other persons with an adequate cause for a nutritional deficiency. In this connection, it may be mentioned that since deficiencies of the water-soluble vitamins are prone to occur in old persons, certain atonic bladders occurring in prostatics might be, either wholly or in part, due to avitaminosis B. We have given thiamin chloride in several such cases, in which the bladder recovered its tone very slowly after drainage, with subsequent improvement, but without sufficiently clear evidence to report the improvement as due to the vitamin.

SUMMARY

Three cases of vesical atony are described, in each of which vitamin B deficiency was likely the cause of the atony, and the administration of thiamin or B-complex was followed by spectacular improvement in bladder function, and in the accompanying lesions.

The author wishes to thank Dr. C. B. Graham and Dr. J. C. Copp for their kind permission to report the above cases.

REFERENCES

1. BOWEN, R. D. AND KUTZMAN, N.: Urinary tract in diabetic women, *Ann Int. Med.*, 17: 427, 1942.
2. STRAUSS, M. B.: Differentiation of Nutritional Polyneuritis from Other Multiple Neuritides: Nutritional Deficiency in Nervous and Mental Disease, Williams and Wilkins, Baltimore, p. 141, 1943.
3. JOLLIFFE, N. AND SMITH, J. J.: Nutrition in the practice of medicine, *Med. Clin. North Am.*, 27: 567, 1943.
4. MCGOOGAN, L. S.: Severe polyneuritis due to deficiency of thiamin chloride in pregnancy, *Am. J. Obst. & Gyn.*, 43: 752, 1942.
5. NEEDLES, W.: Vitamin B_1 therapy in diabetic neuritis, *J. Am. M. Ass.*, 121: 914, 1943.
6. FRESTON, J. M. AND LOUGHLIN, W. C.: *Proc. Am. Diabetes Ass.*, 2: 187, 1942.

Medical Arts Bldg.

RÉSUMÉ

Trois cas d'atonie vésicale, traités soit par la thiamine, soit par le complexe vitaminique B ont répondu de façon étonnante à cette thérapeutique. Sans être une panacée contre toutes les névrites, ce traitement constitue une arme excellente dans les névrites de certaines atonies vésicales. JEAN SAUCIER

THE COLUMNIZED MEDICAL CHART

By John S. Willis, M.D.

Hamilton General Hospital, Hamilton, Ont.

ONLY too often one sees the picture of a doctor, busy with a long list of calls, coming on to a ward, having difficulty in locating his patient's record, and then having to thumb through a dozen or more sheets of paper to find the latest temperature, blood cell count, or x-ray report, which has become buried in that mass of literature known as the hospital chart. And yet this is the most important and can be the most valuable of all the medical records we have.

The hospital chart is not merely a list of the various measurements, estimations, and happenings in the patient's illness; it is a picture of a disease process, and it can be written and arranged like the clear-cut lines of an etching, or thrown together like the meaningless irregularities of a smudge, depending on those who make it; the doctor, the intern, and the nurse.

Thinking of the hospital chart as a picture of a disease process, it seems illogical to make part of it on one page, part on another, part on a third, a fourth, and so on. To appreciate a picture, one must be able to see as much of it as possible at once. In developing this columnized medical chart, an attempt has been made to bring as many parts as possible on to one surface, to be viewed at one time, so that a doctor can see at a glance the temperature, pulse, respiratory rate, number of stools, fluid intake and output, laboratory results, treatment, and progress notes, etc., and thus gain a composite impression of the patient's past and present condition.

DESCRIPTION

The columnized medical chart is the result of two years of experimenting with charting systems, a good deal of the recent work being done at the Hamilton General Hospital. It consists of a simple folder of heavy card, 18½" x 11½" when open, and 11½" x 9¼" when closed, in which latter size it fits the standard letter filing drawer. A typical chart, similar to one used on a case of perforated ulcer at the Hamilton General Hospital, is shown in the accompanying reproductions (Figs. 1 and 2). It can be seen that the front of the folder (Fig. 1) is divided into two sections, one devoted to administrative information; name, address, date of admission, etc., and one devoted to the history, physical examination, and the diagnosis. The back of the folder contains space for additional history, together with a "consent for operation" form, and a clothes and valuables list. Any other routine forms in constant use could be included on this back page.

On opening the folder (Fig. 2), the whole of the inside space is divided into columns, reaching from the top to the bottom, and headed as shown for recording date, temperature graph, pulse, respirations, etc., with a final column for progress notes, doctors' visits, etc. Each day, the date is written in the date column, and then every measurement, laboratory finding, or event in the patient's life for that day, including all the drugs and treatments he received, is recorded, each fact in its own column, right across the page. Thus the doctor is able to obtain a composite picture of the patient's progress for that day and can compare each measurement, treatment, or event with the ones of the previous days, since each pulse rate, each white blood cell count, each dose of morphine, etc., is recorded in its own column. There are 55 lines

on the page, but as many as required can be taken for each day. At midnight, the beginning of each calendar day, a line is ruled across the page and the new day's date written in the date column.

The small administrative section at the beginning contains the information considered essential for use on the ward, for filling out requisitions, for contacting the next of kin, etc. More could be added if desired.

Finally, at the bottom of this front page of the folder are sections for differential diagnosis, provisional diagnosis and final diagnosis, with a line for the signature of the attending doctor (on discharge or death of the patient). As has been said before, there is room on the back page of the folder for additional history, special progress notes, etc., and if more room were required, the doctor could take an ordinary sheet of paper, write further notes thereon and attach it to the

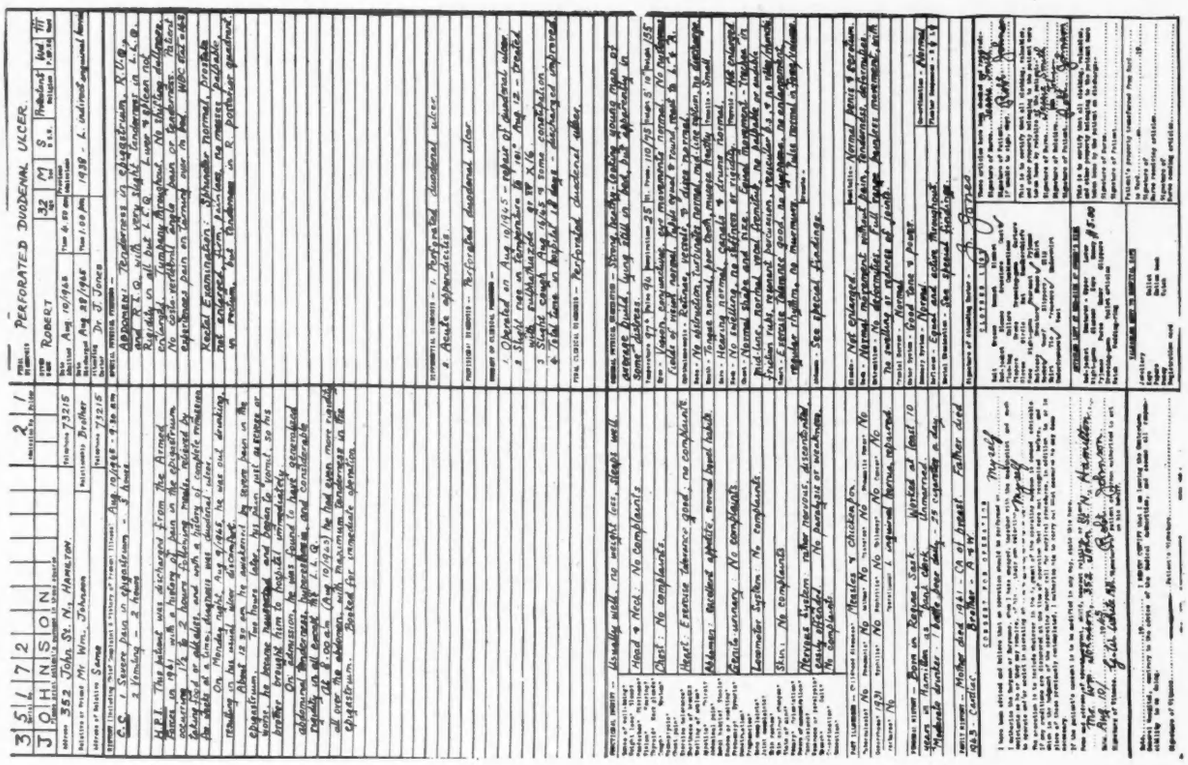


Fig. 1.—Front and back pages of the columnized medical chart folder.

History (Fig. 1).—Due to the fact that each doctor develops his own method of taking a history, this section has been left blank, with the simple suggestive headings, chief complaint, history of present illness, past history, family history, and functional inquiry, as a guide to the order usually followed. Below the history (when the folder is opened out) there is a section on the left hand side entitled general physical examination, which covers the pulse, respirations, blood pressure, etc., and has headings for other examinations. It is intended that this should be a guide to the examination of the patient, and that all important positive (and relative negative findings) should be written under the heading special findings.

inside of the folder. Thus an unlimited quantity of information could be added to the chart in special cases.

Daily charting (Fig. 2).—Daily charting is done on the inside of the folder in the columns mentioned already. The temperature, pulse, and respirations may be recorded in the form of graphs on the space provided, but instead of the graph running from left to right (as in the present temperature graph seen in most hospitals) it runs vertically, so that increases in temperature, etc., move the graph line to the right. This is done to accommodate the graph to the column system and has been found to be quite satisfactory. For those hospitals that prefer to write the pulse and respirations as

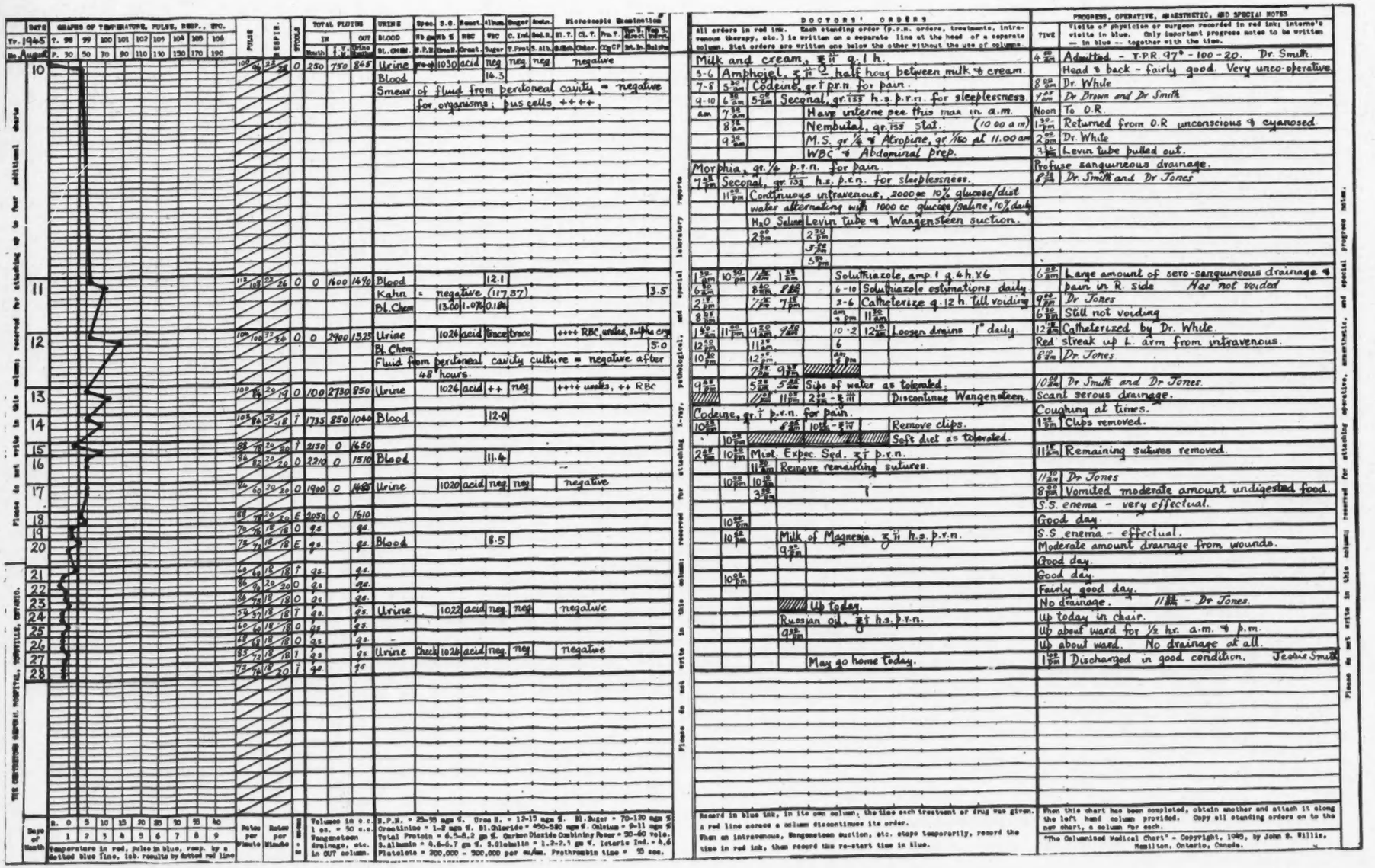


Fig. 2.—Inside of the columnized medical chart folder.

numerals, there are columns provided, one for each.

Stools, fluid intake and output.—The number of stools is recorded in the next column, the letter "E" indicating an enema, if given. Total fluids are divided into fluids IN (intake by mouth in one column, and that by intravenous, intramuscular, or interstitial drip in another), and fluids OUT (urine, vomitus, Wangensteen drainage, liquid stools, etc., in one column). All fluid measurements to be recorded in cubic centimetres, being the totals for the 24 hour period from midnight to midnight.

Laboratory estimations.—The laboratory estimations are divided into three main categories: urine, blood, and blood chemistry. The laboratory column, 4" wide (Fig. 3), is subdivided into

URINE	Spec.	S.G.	React.	Albumin	Sugar	Acet.	Microscopic Examination					Attach X-ray reports
BLOOD	Hbgm	Hb %	RBC	WBC	C.Ind.	Sed R.	Bl. T.	Cl. T.	Pro. T.	Platelet	Van d. Bergh	
Bl. CHEM	N.P.N.	Urea N	Creat.	Sugar	T. Prot	S. Alb.	S. Glob	Chlor.	CO_2 CP	Tol. Ind	Sulpha	
Urine	pre-op	1024	acid	++	neg.	neg	++ pus cells, occas. RBC.					
Blood				14.3								
Bl. Chem.				110.0							5.5	

Fig. 3.—Section from the laboratory results column of the columnized medical chart, showing method of recording urinalysis, blood, and blood chemistry reports.

a column for indicating the category, and eleven sub-columns, each with three headings, one for each category. The urine headings are, specimen, specific gravity, reaction, albumin, sugar, acetone, and microscopic examination (extending over 5 sub-columns). The blood headings are, hæmoglobin (in grams), hæmoglobin (in %), red blood cell count, white blood cell count, colour index, sedimentation rate, bleeding time, clotting time, prothrombin time, platelet count, and van den Bergh test. The blood chemistry headings are, N.P.N., urea N., creatinine, sugar, total protein, serum albumin, serum globulin, blood chloride, CO_2 combining power, icteric index, and sulfonamide estimation. A white count of 14,300, for instance, is recorded by writing the category "blood" in the category column, and then inserting, in the white blood cell count sub-column, the numerals 14.3. By following this method, all the white counts taken on a patient will be written in the same sub-column one below the other in chronological order, so that the doctor can follow them with ease. Uncommon laboratory results, such as blood cultures, a description of the polymorphonuclear leukocytes in a smear, etc., are simply written along the line across the dotted sub-columns.

X-ray reports, pathological and detailed laboratory reports, blood bank cross-agglutination reports, etc., are typed on tinted paper (each department having its own colour) exactly 4¼" wide. These are delivered to the ward and the nurse pastes them into the chart at the edge of the laboratory results column, opposite the day on which they were done. To make the doctor's task easier, it was thought advisable to include as a footnote to the laboratory column the normal blood levels for the ten commonest blood chemistry estimations.

Doctors' orders.—The doctors' orders are divided into two categories, the standing orders such as p.r.n. orders for drugs, daily treatments, continuous intravenous therapy, etc., and the so-called stat orders which apply immediately and are then finished. In order to accommodate the large number of orders written for some cases, a main column 5" wide is provided, which is sub-divided into ten sub-columns by vertical dotted lines (Fig. 4). All orders are

DATE	DOCTORS' ORDERS						
1945 June	All orders in red ink. Each standing order (p.r.n. orders, treatments, intravenous therapy, etc) is written on a separate line at the head of a separate column. Stat orders are written one below the other without columns.						
5	Morphia, gr. ¼ p.r.n. for pain.						
	7.25 a.m.	Seconal gr. 1/35 h.s. p.r.n. for sleeplessness.					
	11.50 p.m.	10.00 p.m.	Continuous intravenous, 2000 cc. 5% glucose in distilled water, alternating with 1000 cc. 5% glucose/saline, daily				
			H_2O	Saline	Levin tube & Wangensteen suction.		
			8.05 p.m.		8.20 p.m.	Catheterize p.r.n.	
						10.30 p.m.	WBC & Blood chemistry in a.m.
							Chest plate in a.m.
6	1.35 p.m.	10.30 p.m.	5.20 a.m.	5.20 a.m.		9.05 p.m.	Prostigmine, amp. ½ stat (a) 9.30 p.m.
	4.40 p.m.		10.40 a.m.	10.40 a.m.			
			4.25 p.m.	4.25 p.m.			
7	5.22 a.m.	10.25 p.m.	Cold compresses to L. foot t.i.d.				
			10-2-6			5.30 a.m.	

Fig. 4.—Section from the doctors' orders column of the columnized medical chart, showing method of recording doctors' orders and charting times.

written in red ink. Standing orders are written each on a separate line at the head of a separate sub-column, which drops perpendicularly from the first word of the order. Once a standing order has been written, as for instance morphine, gr. ¼ p.r.n. for pain (Fig. 4), all that is necessary when a dose is given is to write the time in the sub-column belonging to that order. In the case of continuous intravenous therapy in which, for instance, 5% glucose in distilled water is alternated with 5% glucose in saline, one can allow two sub-columns, one for a record of the glucose in distilled water given, and the

other for the glucose in saline given. Each time a fresh bottle is connected up with the apparatus, the time is recorded in the proper sub-column in blue, and when this bottle becomes empty, the time is recorded in red. Thus the doctor can tell at a glance how long it took for a given bottle of fluid to pass into the patient's blood stream. Similarly, when a continuous intravenous has to be discontinued temporarily, the time can be recorded in red ink and the re-start time in blue, telling the doctor exactly how long the patient went without the therapy.

This arrangement for charting times in conjunction with a standing order can be used for every type of therapy and treatment, catheterization, application of compresses, doses of various drugs, etc., and provision is made for ten standing orders at once. When a standing order is discontinued, a red line is drawn across the column and this column is then free for use in connection with another standing order, should one be written. When a patient goes to the operating theatre, it is customary to discontinue all orders automatically. This may be done by drawing a red line across the main column (all the sub-columns).

Stat orders are written one below the other on separate lines, since they do not require time charting.

Progress notes.—These are written in the last column in this daily charting system. This column is 4″ wide with a small sub-column at the left hand side for inserting the time each progress note was written. This column is devoted to records of the visits of physician or surgeon (in red ink), the visits of the interns (in blue ink), and such notes as are considered pertinent. It is not designed for extensive progress notes, which should be written on a slip of paper 4″ wide and pasted on to the chart along the outer edge of this column.

Operative and anæsthetic notes.—There is a special operative sheet 4″ x 5″, blank on the back for further remarks. It is designed to contain the usual headings found on most operative sheets, and has been found quite large enough for the purpose. The anæsthetic sheet is 4″ x 5″ too. It contains information about the preoperative sedative, the anæsthetic used, the name of the operation, and a graph for recording blood pressure, pulse rate, respiratory rate, etc., by a code system. There is a space for remarks and for postoperative medication notes.

These two sheets are designed to be pasted along the outer edge of the progress notes column, and may be turned back to read the progress notes.

CHRONIC CASES

Patients who stay in hospital for months at a time naturally have more charting than can be placed on one of these folders. As soon as one folder is full, additional pages containing the daily charting outline only, are attached one at a time to the far left hand edge of the open folder in a column specially provided for the purpose. Up to four such additional daily charting forms may be added without making the folder too bulky. Thus, a total of 275 lines of charting can be accommodated in one folder, sufficient to carry the record of the chronic case through about four months. Further charting space is then obtained by starting folder number two, and so on, three folders being sufficient for one year or even longer.

EXPERIMENTAL USE OF THE COLUMNIZED MEDICAL CHART

These charts have been used experimentally at the Hamilton General Hospital on about twenty cases in all parts of the hospital, including the following cases: lobar pneumonia, gastric resection, perforated duodenal ulcer, hæmorrhoidectomy, staphylococcal nephritis, herniorrhaphy, diaphragmatic hernia, and appendectomy. In no case was any difficulty found in recording the history, physical examination, and daily charting of the patient's illness, and the resultant picture in each case was easier to read and appreciate, saved a great deal of paper and expensive printing, and was easier to file and store in the record office.

Special types of cases, such as gynæcological, urological, obstetrical, and neurological cases could be charted by either having a special folder containing special questions related to each particular specialty, or by pasting over the standard general chart special forms containing these special questions.

It would seem sensible to keep hospital charting as simple as possible, with as few forms as possible. It is hoped that the columnized medical chart approaches in some small measure this ideal.

DUPUYTREN'S CONTRACTURE

By Captain W. B. Ayre, R.C.A.M.C.

Montreal

I RECENTLY examined the hands of 486 members of the Veterans' Guard of Canada. There were 64 (approximately 13%) who exhibited early or well advanced Dupuytren's contracture. Considering that this condition has been regarded as one that is not common this is an unusually high incidence. In all but two cases the contracture had begun recently while on active service. This strongly suggests that something peculiar to military service may predispose to the development of Dupuytren's contracture.

Dupuytren's contracture involves principally the central portion of the palmar fascia. This lies directly beneath the skin, covering the palmar vascular arches and their digital branches, the flexor tendons and their attached lumbrical muscles, the digital nerves, and the interossei. Proximally, it is attached to the flexor retinaculum and has the tendon of the palmaris longus inserted into it. Distally, from its superficial aspect fine strands are inserted into the skin. Those most characteristically involved in the contracture are inserted just proximal to the distal palmar crease in line with the ring finger. A subcutaneous fibrous nodule and puckering of the skin at this point are the commonest early signs of developing Dupuytren's contracture. The main distal insertion is by four strands which run into the medial four fingers to become attached to the fibrous flexor tendon sheaths and the periosteum of the proximal two phalanges. Of these four strands those most frequently involved are associated with the medial two fingers. By their contraction movement at both the metacarpophalangeal and proximal interphalangeal articulations may be restricted; and in a fully advanced contracture the ungual extremities of the fingers involved may be held constantly in contact with the palm.

The index and middle fingers are seldom involved; and the thumb, through contraction of the thinner lateral portion of the palmar fascia, only rarely. There is occasionally an associated contracture of the plantar fascia. A number of cases have been reported in which fibrous contractures of the palmar and plantar fascia have been associated with fibrous induration of the connective tissue sheath of the corpus cavernosus of the penis.

In 37 of the 64 cases referred to above the contracture was early. Most of this group exhibited small tough nodules beneath the skin of the palm in line with the medial two fingers and just proximal to the distal palmar crease. These two fingers were subjected to minimal extensor restriction. In 25 cases the characteristic palmar nodules were associated with a moderate flexor contraction of the medial two fingers. In two cases the contracture was complete, the ring and little fingers being drawn up by flexion at the metacarpophalangeal and proximal interphalangeal articulations until the ungual extremities were in contact with the palm. In three cases the middle finger was involved. In one case the thumb was involved. In one fibrous induration of the penis was present. There were no cases of involvement of the plantar fascia.

Contractions involving the fingers were described by Plater in 1610, Henry Cline in 1808, and Sir Astley Cooper (who alludes to contracture of the palmar fascia as one possible cause) in 1818. Dupuytren[1] in 1832 by dissection of an affected hand proved conclusively that involvement of the palmar fascia is the basic etiological factor He describes the dissection as follows:

". . . . I laid bare the palmar fascia and observed with surprise that it was in a state of tension, contracted and diminished in length; from its lower part something like cords proceeded to the sides of the affected fingers. On endeavouring to extend the fingers, I clearly perceived that the fascia became still more tense; here was a ray of light. . . ."

ETIOLOGY

Definite facts concerning age incidence, sex and occupation of those who have developed the contracture are known; but concerning the essential cause of Dupuytren's contracture there is no agreement.

The condition most commonly occurs in males (male to female ratios reported ranging from 6:1 to 18:1) over 40 years of age although it occurs in younger people. All the men in the group examined by me were over 40. The age of onset in the 64 cases exhibiting the contracture was as shown below.

Age group	*Number of cases*
40 - 45	6
45 - 50	25
50 - 55	23
55 - 60	6
60 -	4

The contracture more commonly begins in the right hand but eventually, as a rule, becomes bilateral. In the group studied it began in the right hand in 34, in the left in 20, and in both hands simultaneously in 10.

In previously reported series the incidence in non-manual workers and manual workers has been about equal. The large majority in this series had been manual workers before enlistment and had been actively engaged during their term (an average of four years) of service.

Among the men in this group there was no observable common physical constant. There was nothing characteristic about the size or shape of the hands nor moistness of the palms. They were men of all types. Their general health appeared to be good. There was a remarkable absence of "rheumatic" complaints.

Theories as to the fundamental cause have been numerous; each contributor having a new and entirely different initial approach. Trauma, heredity, chronic infection, lead poisoning, gout, rheumatism, diabetes mellitus, arteriosclerosis, loss of protective subcutaneous fat with age, embryological malformation, neurogenic influences, thyroid deficiency, hypocalcæmia, coronary artery disease, fibroplastic diathesis, have each had their proponents. For a complete bibliography on this subject the reader is referred to Kanavel, Koch, and Mason.[2]

It was Dupuytren's opinion that trauma was primarily involved. He states: "Many of those who are thus affected have been in the habit of using force with the palm of the hand, and of handling hard bodies, such as a hammer, an oar or a plough." In support of this possibility is the fact that it more commonly begins in the right hand; that it is much more common among males; and that it is commonly related by the patient to some traumatic incident. Those who object to this explanation point out that the condition is as common among non-manual as it is among manual workers; that it frequently begins in the left hand; that it is almost always bilateral; and that it is frequently associated with contractures of the plantar aponeurosis and occasionally with fibrous induration of the penis. These objections cannot be ignored. Although it is impossible to deny that trauma alone could cause Dupuytren's contracture it appears probable that in most cases there is an underlying predisposing constitutional factor. In any event trauma is an important factor, for once initiated a repeated stretching or tearing of the connective tissue fibres would undoubtedly aggravate the condition.

There have been numerous reports featuring heredity as a prominent factor. Corlette,[3] who marshals his facts in a most convincing manner, has recently reported a series of 25 cases. These represent 22 families. In 7 of the 22 there was a clear history of Dupuytren's contracture as a familial disease. The condition appeared to be transmitted through, without as a rule affecting, the female. It is his opinion that if a careful investigation were made the hereditary factor would be found as the essential cause in every case. Family history was specifically enquired into in each one of the present series. In only one case was it positive for this condition.

The almost invariable involvement of the ulnar side of the hand convinced Powers[4] of the influence of a neurogenic factor. He believes that there is a close anatomical relationship between the thoracic sympathetic ganglia, the pleura, and the ulnar nerve. He classifies Dupuytren's contracture with such trophic conditions as scleroderma and hypertrophic osteodystrophy. He states: "My own belief is that intrathoracic and other visceral conditions produce irritation of the sympathetic ganglia and that there is then hyperactivity of the ganglion, which results in one, or more of the trophic disturbances at the periphery which I classify together." He has noticed the frequent association of Dupuytren's contracture and Raynaud's disease "because they both have the same cause: an irritated sympathetic. . . In the hereditary cases I suppose that an unstable sympathetic nervous system is the thing that constitutes the predisposition."

The possibility of sympathetic irritation in visceral disease as a factor in etiology is also referred to by Kehl,[4] who reports six cases of coronary artery disease in which Dupuytren's contracture appeared as a sequel.

PATHOLOGY

The essential features of the gross pathology were fully described by Dupuytren. Careful studies of the microscopic pathology have been made by a number of workers. Jansson[5] found a marked hypertrophy of the adventitia of the blood vessels, making the vessels like the centres of new growth. There was no evidence of inflammation. He regarded it as a purely hypertrophic process, believing that it began in the adventitia of the regional vessels. There were also areas which suggested pressure atrophy. Horwitz[6] studied first the microscopic anatomy of the normal palmar fascia in

subjects of different ages. He noted "a tendency to increased thickness of the fascia and to greater density and compactness of the parallel collagenous fibres was apparent in the older age group." These changes with age in individuals with a certain fibroplastic diathesis he thought responsible for the development of the contracture. He compares it to "other localized fibroplasias such as keloid and fascial dermoid". He could find no evidence that the proliferative process arises from the walls of blood vessels.

CLINICAL FEATURES

The earliest sign of developing Dupuytren's contracture is a nodular thickening of the palm as described above. This hypertrophy invariably precedes the actual contraction. The process may become arrested at this stage (Corlette states the initial nodule has been present in the palm of his hand for 25 years) or proceed with varying degrees of rapidity. Within six months, in several of the cases studied, the process had advanced to a well marked contracture. In two cases the contracture was complete and bilateral in four years' time.

Dupuytren states: "The affection begins, proceeds, and reaches its climax without any pain." This was true in every one of the cases studied. A few experienced a mild burning sensation in the palms, and discomfort limited forceful extension of the fingers involved, but otherwise subjective features were negative.

Powers feels that Dupuytren's contracture cannot be regarded as an entity in itself but has rather the significance of an important diagnostic sign indicating the presence of visceral disease. We could find no evidence to support this theory. On enlistment the members of the group had all been medically examined before being accepted. Their average length of service at fairly strenuous duties was four years. Most had gained moderately, a few excessively, in weight during that time. There were few complaints suggesting visceral disease and in 22 cases examined clinically no abnormal physical signs were found.

COMMENT

It is probable that Dupuytren's contracture is the result of trauma in individuals with a certain constitutional predisposition. We have not been able to demonstrate however any particular constitutional factor in the group studied.

The unusually high incidence in this group is partly due no doubt to the fact that all of the members of the group were males over 40 years of age. However, it is questionable whether a similar group of men selected from the civilian population would reveal as high an incidence. What particular factor may be responsible for the difference, and whether or not any particular feature of military life is concerned, we are unable to say.

SUMMARY

1. In the examination of 486 members of the Veterans' Guard of Canada, 64 cases of Dupuytren's contracture were found. Of these, 34 were early, 25 moderately advanced, and 2 complete. The thumb was involved in one case. In one other there was fibrous induration of the penis.

2. The historical, etiological, pathological and clinical features of Dupuytren's contracture have been briefly reviewed.

3. It has not been found possible to demonstrate any definite etiological factor in this group. No evidence in support of previous theories concerning etiology, with one exception, could be found. This one exception is trauma. During civilian life the members of the group were, for the most part, manual workers and during an average of four years' army service they have been daily engaged in guard duties, which involves the handling of a rifle during a large part of the day.

We wish to express our appreciation to Major A. T. Smith, Major L. L. Brunton, and Major A. J. Collison as Officers Commanding Companies 18, 22, and 26, respectively, of the Veterans' Guard of Canada, through whose kind co-operation the examination of this group of Veteran Guards was possible.

REFERENCES

1. Baron Guillaume Dupuytren on Lesions of the Vascular System, etc. Trans. and Edit. by F. LeGros Clark. Pub. of the Sydenham Society, p. 220, 1854.
2. KANAVEL, A. B., KOCH, S. L. AND MASON, M. L.: *Surg., Gyn. & Obst.*, 48: 145, 1929.
3. CORLETTE, C. E.: *Med. J. Aust.*, 2: 177, 1944.
4. POWERS, H.: *J. Nerv. & Ment. Dis.*, 80: 386, 1934.
5. JANSSEN, P.: *Arch. f. klin. Chir.*, 67: 761, 1902.
6. HORWITZ, T.: *Arch. Surg.*, 42: 687, 1942.

In all things relating to disease, credulity remains a permanent fact, uninfluenced by civilization or education.—Osler.

RESTROPIN FACTOR IN CANCER IN RELATION TO THE RETICULO-ENDOTHELIAL SYSTEM

By H. C. Connell, L. A. Munro and A. Medley

The Hendry-Connell Research Foundation, Kingston, Ont.

MANY authors have concluded that the body function responsible for resistance and immunity is resident in the reticulo-endothelial system. Jaffe,[11] in 1931, reviewed 160 papers relating the R.E.S. with immunity. The reticulo-endothelial system includes the reticular cells of the spleen, lymph nodes, lymphatic tissue, Kupffer cells of the liver, the marginal cells of the capillaries, bone marrow, suprarenal cortex, pituitary body, histiocytes, splenocytes, coloured monocytes, and also other special cells of the reticular walls of the capillary system, as well as the basal membrane of many glands.

It is accepted that the activity of the R.E.S. is indicated by the extent of removal of a dye like congo red when injected into the blood stream. The test as proposed by Adler and Reimann[1] consisted in the determination of dye concentration six and sixty minutes after injection, the ratio of the two values times 100 being termed the congo red index (C.R.I.). A high index indicates a large amount of the dye still in the blood or unadsorbed by the R.E.S., and therefore a low R.E.S. activity.

A number of workers have found an impairment of the R.E.S. in cancer, as shown by histiological examinations paralleled by C.R.I. determinations. Calo[4] examined the various organs, histiocytes, etc., of mice with transplanted tumours. Impairment was also noted by Kageyama,[12] Csato, Wetzler-Legetti and Wiesner[8] and Hoch-Legetti.[1, 9] The same findings were obtained in human neoplasia.[3, 13, 19, 24] Stern[20] using a modified procedure for the determination of the C.R.I. found a damaged reticulo-endothelial system in 86% of 100 cancer patients.

Wetzler-Legetti and Wiesner[22, 23] reported the recovery of two separate factors in alkaline extracts of the anterior lobe of the pituitary, which appeared to exert a control over the R.E.S. One of the factors increased R.E.S. activity as determined by the congo red index, while the other caused a depression of the activity. To these extracts they gave the name of positive and negative restropin. These authors subsequently found the presence of a positive restropin factor in the blood of normal, cancer-free animals whereas a negative factor was obtained from the blood of animals with Walker sarcoma. Also the blood of normal rats which were made sarcomatous by inoculation gave first a positive factor which was replaced by a negative restropin as the disease progressed.[24]

These findings were also obtained with humans. Samples of blood were collected from 45 subjects, of whom 8 were healthy, 15 exhibited various conditions other than malignancy, and 22 were malignant. In the tests on the latter group, 4 of the injected rabbits died so that no congo red index could be obtained. Negative factors were shown by all malignancies except in two cases (carcinoma of the ear and tumour of the parotid). The authors concluded that, "as a rule the normal restropic factor of blood tends to be reversed in malignant disease".

Such results would lead one to hope that this test might be helpful in prognosis or in following the progress of a patient on treatment. Since, however, the above observations were made on a relatively small group of human subjects, it was thought advisable to extend the work by the examination of a larger group.

METHODS

The blood restropin factors were prepared according to the method of Wetzler-Legetti and Wiesner.[23] Blood was received in sterile 25 ml. flasks containing broken glass for defibrination. An equal volume of 20% sulphosalicylic acid was added to the defibrinated blood and the mixture shaken vigorously. The precipitate was collected by centrifuging and taken up in 50 ml. of 6% aqueous ammonia. After standing in the incubator at 37° C. for 12 hours and then adjusted to pH 5 with acetic acid, the precipitate produced by an equal volume of 90% alcohol was discarded and an equal volume of 95% alcohol was added to the supernatant. The resulting precipitate was taken up with distilled water so that the final volume was the same as that of the original volume of blood. The undissolved residue was centrifuged out and the clarified extract kept at 4° C.

The congo red index of a healthy rabbit was determined and injection of 1, 2, and 2 ml. were made on successive days and the C.R.I. again determined on the fifth day, as it has been shown that the maximum effect was produced at that time. Fresh rabbits were used for each determination of restropin. Our limited facilities restricted these tests to two per week.

DETERMINATION OF THE CONGO RED INDEX

In determining the C.R.I., Stern withdrew three samples of blood from the animal; one before the injection of 1% congo red, a second sample six minutes after the injection, and the

third sixty minutes later. In each case the blood is drawn into a syringe containing one-fifth the final volume of 3.8% citrate. Samples are centrifuged to remove red cells and 2 ml. of the supernatant is used. To sample one, 0.1 ml. of 0.1% congo is added; to the remaining two samples, 0.1 ml. of 0.05% congo is added. The samples are mixed with 2 ml. of a urea buffer and acidified with 0.5 ml. of 10% HCl, giving a blue colour. The colour is estimated in a colorimeter, putting the standard solution (No. 1) in one arm at mark 10, and balancing the colour in the second arm with No. 2 and No. 3 samples. The difference between samples No. 2 and 3, expressed as a percentage of No. 2 measures the rate at which the dye has disappeared from the circulation and is referred to as the congo red index.

There are certain objections to this method. First, the time values are chosen arbitrarily at six and sixty minutes. It is certain that the concentration of the dye at six minutes will depend on the rate of adsorption, which is always greatest at the beginning, and in the case of an animal with a very active R.E.S. the amount taken up before the sample is drawn may amount to an appreciable proportion of the dye injected. In other words, owing to the different slopes of the initial portions of the adsorption rate curves, a large error is introduced. That the adsorption rate curves do differ in the initial portion has been observed in this laboratory and has been shown by Scholl.[18]

A second objection to Stern's method is the necessity of using a relatively large amount of blood. Also the colorimetric method he used is not very accurate.

Scholl has suggested a micro method for doing C.R.I. using only 0.05 ml. of serum. In his method, a vein in the rabbit's ear is punctured and a drop of blood collected in a glass capillary 1 to 1.5 mm. in diameter and about 100 mm. in length. Fine sodium citrate is blown through the dry capillary so that tiny amounts stick to the walls and prevent coagulation. The tube is sealed with a plug of plasticine and centrifuged at 2,000 r.p.m. for 5 minutes. The capillary is then cut above the red cells and plasma allowed to drip on to a small watch glass from which 0.05 ml. is transferred to a test tube containing 0.85 ml. of 1% HCl. The blue colour is then evaluated in a micro colorimeter.

In the present work, the samples are collected four and sixty minutes after the injection of 3 ml. of 1% congo from the ear in uncitrated tubes of slightly larger diameter than used by Scholl. This was found to be satisfactory if the tubes are centrifuged immediately. It has been found better to insert the capillary tube with its plug of plasticine into the orifice of a small rubber vial stopper. On cutting the tube, the serum is drawn directly into a micro pipette and transferred to a micro colorimeter tube. The concentration of residual dye can be read directly in a photoelectric colorimeter by comparison with a standard congo red serum curve.

RESULTS

The bloods from 103 cancer patients furnished through the courtesy of Dr. W. C. Kruger and staff of the Toronto Western Hospital, were examined for restropin. A list showing the diagnosis and restropin factor found, is appended.

In our hands, 48% gave a negative factor, 34% a positive factor, while 18% were neutral in reaction.

DISCUSSION

For the determination of the congo red index on which the factor is judged, Wetzler-Legetti and Wiesner used rabbits which had a basic C.R.I. of 30 to 50. They stated that, "a fall produced by this experimental procedure will be *more manifest* if the basic index is high, than if it is low; conversely, a rise is *more impressive* if the basal index is low". They do not suggest that the sense, or sign of the test is altered by differences in the initial index, that is, in the R.E.S. activity of healthy rabbits.

An examination of our results indicated that 36% of the rabbits used had an original index between 30 and 50. Of this group, which are directly comparable with those of the previous workers, 50% showed cancer restropin to be negative, 42% were positive and 8% indecisive.

If the whole group is divided according to the initial C.R.I. of the animal used for the test, the following results appear.

Initial C.R.I.	0-10	10-20	20-30	30-40	40-50	50-60	60
Negatives %	88	70	60	63	37	31	14
Positives ...	12	30	35	31	53	58	86
% of animals	16	9	18	17	19	14	7

While the number of animals with index above 60 is only 7% of the total used, the distribution

of the results indicates a continuous trend toward a decreased finding of negative restropin as the initial index of the test rabbit increases.

A possible source of divergence between the findings of this investigation and the observations of Wetzler-Legetti on the 18 cancer patients cited above, may lie in the fact that many of our patients had received treatment prior to the test for the restropin factor. The previous authors do not indicate whether or not the bloods used by them were from treated or untreated patients. Of the group examined by the writers, some 13 had received no treatment. Of these a much higher percentage gave negative factors; 8 of the 13 gave negatives, 2 positive and 3 were inactive.

X-ray therapy has been shown to influence the R.E.S. Weak doses have been found by several to stimulate it.[5, 6, 14, 15, 17] On the other hand high dosages of x-radiation cause a definite damage to the R.E.S.,[2, 7, 21] as indicated by the C.R.I. Stern[20] reported observations on the C.R.I. of 12 cancer patients before, during and after x-ray treatment. In four cases the C.R.I. was shifted from a high value typical of a damaged R.E.S. as found in malignancy to lower and more normal values. In two of these cases clinical improvement was obvious.

Changes in the R.E.S. will be reflected eventually in the restropin. Csato, Wetzler-Legetti and Wiesner[7] found that the blood of rats bearing grafts of Walker sarcoma showed a change from positive restropin to inactive and finally the negative factor as the tumour progressed.

It is apparent, therefore, that treatment may have an influence on the results of the restropin test.

Of the patients who had received previous treatment with x-ray, 31 showed negative factors, 33 positive, while 12 were inactive. For those having had surgical treatment, the numbers were 20 negatives, 20 positives, 7 inactive. Of those receiving radium treatment, 5 were negative, 9 positive and 4 inactive.

Five of the six patients at the bottom of the list have been retested after the lapse of some months. In two, the factor was positive as at the initial test, in three the factor changed from negative to positive. Two of these received ensol only. In the sixth case the same patient showed a negative factor one week previously.

CLASSIFICATION OF CASES

Diagnosis cancer	*No. of negative restropin*	*Positive restropin*	*Inactive*
Breast	11	7	7
Cervix	14	14	2
Ovaries	1	1	0
Vagina	1	2	0
Uterus	0	2	0
Pelvis	1	0	0
Prostate	2	0	0
Bladder	4	0	0
Bowel	2	0	0
Vulva	1	0	1
Rectum	1	1	0
Larynx	2	1	0
Œsophagus	1	2	0
Neck	1	0	0
Kidney	0	1	0
Stomach	0	1	0
Antrum	0	1	0
Mediastinal	0	1	0
Lung	2	1	1
Bronchogenic	0	0	1
Pharyngeal	1	0	1
Epidermoid	0	1	1
Face	1	0	0
Spine	0	1	0
Melanoma axilla	1	0	0
Fundus uteri	1	1	0
Right max. sinus	0	1	0
Lympho sarcoma	1	0	0

SUMMARY

In view of the above results, the writers feel that the utility of the test is limited. The direct determination of the congo red index on the patient would undoubtedly be less subject to error in judging the state of the R.E.S. as an aid in prognosis. Other tests also appear to be more satisfactory than the determination of the restropic factor (*e.g.* 16).

The whole idea of two different blood factors, positive and negative restropin, may be in error. The literature contains many examples of stimulation and depression of the R.E.S. by different concentrations of the *same substance*. This aspect of the restropin problem is being investigated.

The large number of bloods examined from patients has been made possible by the kind co-operation of Dr. W. C. Kruger, Chief of the Department of Radiology of the Toronto Western Hospital, to whom we wish to extend our thanks, and by grant from the Government of the Province of Ontario, through the Department of Health.

REFERENCES

1. ADLER, H. AND REIMANN, F.: *Zeit. f. ges. med.*, 47: 617, 1925.
2. BAGG, H. J.: *Am. J. Roentgenol.*, 40: 418, 1938.
3. BARBERA, S.: *Zeit. f. Krebsforsch*, 42: 82, 1935.
4. CALO, A.: *Zeit. f. Krebsforsch*, 32: 151, 1932.
5. *Idem*: *Strahlentherapie*, 46: 529, 1933.
6. CASPARI, W.: *Strahlentherapie*, 18: 17, 1924.
7. CLEMMESEN, J.: *Am. J. Cancer*, 35: 378, 1939.
8. CSATO, T., WETZLER-LEGETTI, C. AND WIESNER, C. P.: *Am. J. Cancer*, 36: 262, 1939.
9. HOCH-LIGETI, C.: *Am. J. Cancer*, 39: 365, 1940.
10. *Idem*: *Cancer Research*, 1: 28, 1941.
11. JAFFE, R. H.: *Physiol. Rev.*, 277, 1931.
12. KAGEYAMA, T.: *Jap. J. Obst. & Gyn.*, 20: 291, 1937.

13. KRATSCHELL, U.: *Fortsch. Med.*, 51: 983, 1933.
14. LEWIN, C.: *Zeit. f. Krebsforsch*, 27: 138, 1928; 32: 127, 1930.
15. MATSUOKA, H.: *Jap. J. Obst. & Gyn.*, 17: 25, 1934.
16. MUNRO, L. A.: *J. Phys. Chem.*, 48: No. 4, July, 1944.
17. MURPHY, J. B., MAISEN, J. AN STURM, E.: *J. Exper. Med.*, 38: 645, 1923.
18. SCHOLL, R.: *Quart. J. Pharm. & Pharmocol.*, 15: 898, 1942.
19. SCHROEDER, W.: *Klin. Wchnsch.*, 18: 248.
20. STERN, K.: *J. Lab. & Clin. Med.*, 26: 809, 1941.
21. TSCHNER, E., GOTTLIEB, G. AND SPRITZER, M.: *Compt. rendu soc. bio.*, 124: 955, 1937.
22. WETZLER-LEGETTI, C. AND WIESNER, B. P.: *Nature*, 104: 892, 1937.
23. *Idem*: *Endocrinology*, 22: 693, 1938.
24. *Idem*: *Brit. M. J.*, 2: 444, 1938; and *Nature*, 141: 1100, 1938.

Case Reports

TERATOID TUMOUR AND CARCINOMA OF THE TESTIS*

By Francis N. Wilson, B.A., M.D.

Montreal

A.J., aged 28 years, was admitted on March 31 to the Montreal General Hospital, complaining of swelling of the left testicle, pain in the right chest with cough and difficulty in breathing, and loss of weight and strength.

The family and personal history were irrelevant.

Present illness.—About one year previous to admission the patient first noticed a swelling about the size of a walnut in the left testicle. This swelling progressed steadily in size. There had never been any associated pain. About four months previous to admission the patient noticed a lump in the left groin. This had not shown any apparent increase in size. In April he "caught cold" which had persisted without improvement. There had been a twenty-pound weight loss in the year's history.

Physical examination.—There was marked emaciation. The skin was dry, warm, and pale yellowish in colour. Subcutaneous tissue was scanty. Breathing was attended with marked stridor. Mucous membranes were pale and there was a slight subicteroid tint to the conjunctiva. The tongue was coated and somewhat dry. The teeth were carious and gums bled freely. The pharynx was inflamed.

The chest walls were thin and symmetrical. Expansion was poor, particularly on the right side. Dilated superficial veins were seen in the axillary and pectoral regions. There was evidence of a large amount of fluid in the right pleural cavity with displacement of the mediastinum to the left. The left base was dull. Breath sounds were diminished and there were numerous moist and sibilant râles.

The x-ray of the chest showed a dense shadow obscuring the right lung up to the level of the 6th rib posteriorly, resembling fluid. The heart was displaced to the left. Throughout the left lung were rounded areas of consolidation, but no fluid.

Nothing abnormal was found in the heart other than displacement to the left. Blood pressure was 130/80. Pulse 120 regular, somewhat weak and thready.

The abdomen appeared somewhat full, symmetrical, and moved only slightly with respiration. There were small distended veins over both flanks and slight tenderness in the right upper quadrant. There was an indefinite movable dullness in the flanks. The liver was palpable as a hard, irregular mass two fingers-breadth below the costal margin.

The nervous and locomotor systems were negative.

Glandular system.—Negative except for two glands in the left groin which were enlarged to about 3 cm. in diameter, were tense, fluctuant, not inflamed or tender, and were fixed in position but not adherent to the overlying skin.

Genito-urinary system.—The kidneys, ureters, bladder and penis were negative. The right scrotal sac and contents were normal. On the surface of the left scrotal sac were large dilated veins. The sac was filled by a mass the size of a grapefruit, in which the testis and epididymis could not be differentiated. The mass was uniformly firm, with a smooth surface. At the upper extremity of the mass was a smaller tumour, the size of a lemon, which was fluctuant and transmitted light. There was no testicular sensation.

The urethra admitted a soft catheter easily. Residual urine 15 c.c. Urine: 1.020, alkaline, turbid, pus +, sugar 0. Microscopic: pus 8 to 10 cells per high power field; red blood cells 20 to 30 per high power field.

X-ray report of genito-urinary tract: "There is increased density of the left half of the sacrum and the left ilium to the sacro-iliac joint".

Progress of the case.—Admitted March 31 with normal temperature which rose to 101 for

* From the Department of Pathology, the Montreal General Hospital.

two days, and thereafter was between 97 and 98. The pulse averaged 110; the respirations 28.

April 2.—The blood chemistry showed blood urea nitrogen 21, creatinine 1.53. Wassermann test negative.

April 3.—The breathing had become increasingly difficult, and the patient was in a cold sweat. The right chest was aspirated and 500 c.c. of dark bloody fluid withdrawn. At the termination of the aspiration the needle tip was felt to grate on solid tissue. Relief of dyspnœa followed aspiration.

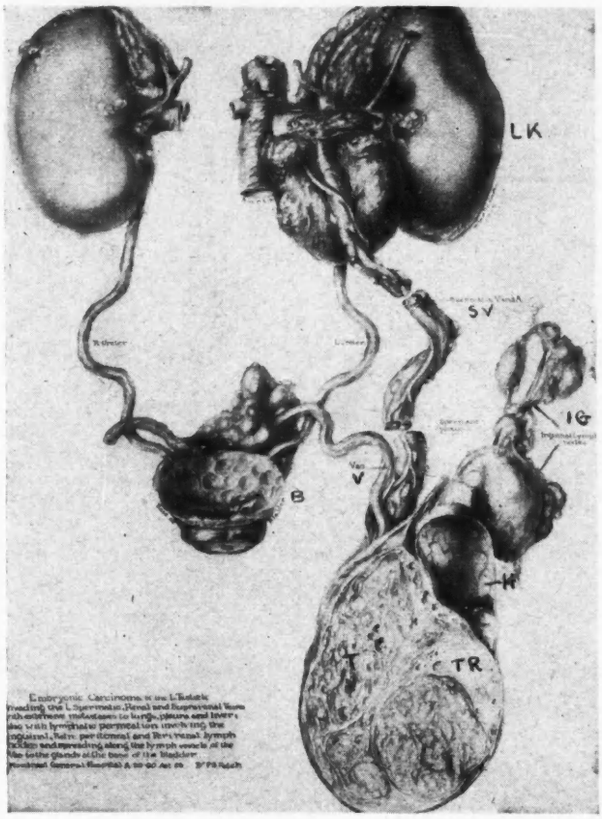


Fig. 1

T—Testicular tumour with the semilunar teratoid mass at TR.
H—Hydrocele. B—Bladder.
IG—Inguinal glands. V—Vas.
LK—Left kidney. U—Ureter.
SV—Spermatic vein plugged with tumour. Note the small nodules of tumour in the lymphatics on its surface.
There are masses of enlarged lymph nodes at the base of the bladder and hilus of the left kidney. The renal vein which is laid open is packed with tumour.

Pathological report on aspirated fluid: "Section consists of a bloody cellular mass in which the cells are composed chiefly of blood elements. Scattered throughout are numerous large dark staining cells, singly and in small clumps. They are polyhedral in shape with dense staining nuclei and vacuolated cytoplasm. These are undoubtedly tumour cells, metastatic from the tumour of the testis."

April 4.—The right chest was re-tapped and 650 c.c. of similar fluid withdrawn, again with temporary relief. The patient, at times was very restless, his general condition was very poor and the pulse thready.

April 6.—The patient died (about one year after he first noticed the tumour in the testicle). The clinical diagnosis was embryonal carcinoma of the testicle with widespread metastases.

Summary of autopsy report.—The body was well-developed, but very emaciated. The left inguinal glands were enlarged, discrete, rather soft, and when cut into, were quite mushy.

In the scrotum was a large mass as described in the physical examination. When the scrotum was opened, the mass was found to be enclosed by a thin tense adherent capsule, yellowish-brown in colour and quite vascular. The mass weighed 700 gm. and measured 10 cm. in diameter. Above the tumour there was a hydrocele 8 x 6 cm. containing bloody fluid. Protruding from the wall adjacent to the tumour was a yellowish-white friable mass about the size of a walnut and three other small nodules on the lateral wall.

The large tumour (Fig. 1) when sectioned, bulged from its capsule. For the most part it was composed of a yellowish-white pultaceous mass, divided into irregular circular lobules by bands of connective tissue. At the upper pole, just beneath the capsule, there was a semilunar mass 6 x 3 cm., pearly white in colour and of the consistency of cartilage. Within it were several small yellowish-white areas and small cystic spaces. Nothing resembling testis or epididymis was found.

The spermatic vein was packed solidly throughout with tumour. The growth had extended into the renal vein and even for a short distance into the adrenal vein. The lymphatic vessels along the vein were marked by minute tubercles of tumour and at the level of the renal pelvis there was a large cluster of lymph nodes similar to those in the groin. The tumour had likewise spread along the vas. All about the base of the bladder and seminal vesicles there was another cluster of enlarged soft lymph nodes.

The liver was enlarged to about twice the normal size. Scattered over its surface were numerous raised yellowish-white masses from 0.5 to 5 cm. in diameter, very soft and with

depressed centres. When cut into they bulged and were almost of a fluid consistency. About one-third of the liver was involved.

The right pleural cavity was filled with bloody fluid completely compressing the lung. Both pleural surfaces were studded with closely packed tumour nodules and numerous pieces of tumour were free in the fluid.

Throughout both lungs were numerous nodules similar to those in the liver. On the left side the tumour had not broken into the pleural cavity. It was quite dry and the pleura retained its normal appearance.

Structure of the tumour.—The hard mass (Fig. 1) in the upper pole of the large tumour proved to be of teratoid nature. Connective tissue predominated and varied from myxomatous to mature fibrous tissue. Embedded in this tissue were whorls of stratified squamous epithelium keratinized at their centres (Fig. 2a), numerous glandular spaces lined by cuboidal and columnar epithelium (Fig. 2b), and islands of cartilage and fat (Fig. 2c). In one area were a few grains of calcaroid material and a cystic space, lined by rather flat cells, and invaginated on one side by blood vessels. This structure suggested a ventricle and choroid plexus. No glial tissue was found.

Of special interest were the glandular structures representing the endoderm. Besides the well-formed glands shown in Fig. 2b there were others, irregular in shape, lined by stratified

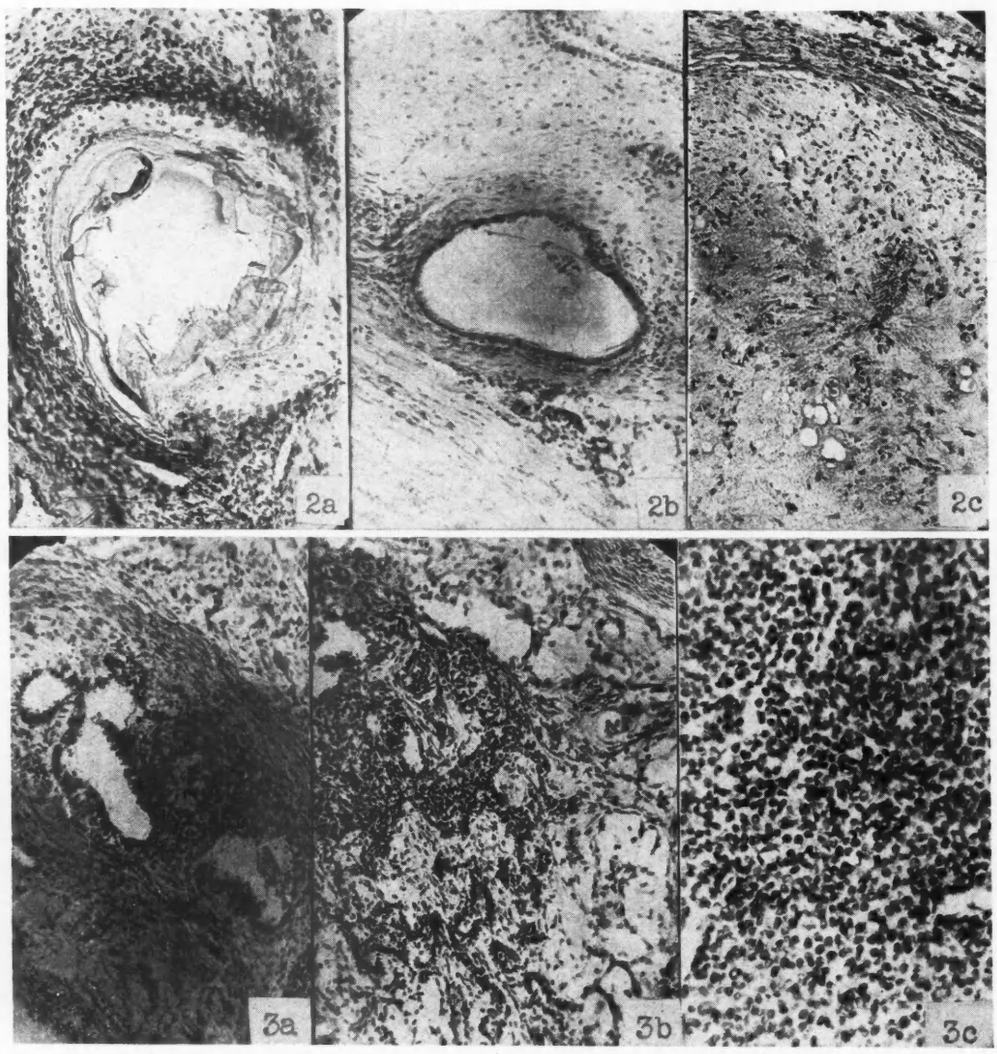


Fig. 2.—Structure of teratoid mass in the testicular tumour representing three germ layers. (a) A whorl of stratified squamous epithelium keratinized at the centre. (b) A glandular space lined by cuboidal and columnar cells. (c) Chondromatous tissue with a few fat cells within it. **Fig. 3.**—Glandular structures representing endoderm in teratoid tumour. (a) Irregular glands with hyperchromatic epithelium which is invading the connective tissue. (b) Irregular acini and anastomosing strands of epithelial cells embedded in a myxomatous matrix. (c) Solid mass of tumour cells.

hyperchromatic cells which had, in places, passed through the basement membrane and invaded the surrounding connective tissue (Fig. 3a). In the adjacent fields were islands of irregular acini and anastomosing strands of epithelial cells embedded in a myxomatous matrix resembling the mixed salivary gland tumours (Fig. 3b). Finally this tissue gave way to a diffuse mass of rounded and polyhedral cells with vesicular and hyperchromatic nuclei and scant clear cytoplasm containing a few eosinophilic granules (Fig. 3c). Much of this diffuse cellular tissue was necrotic and at the margin of the necrotic areas numerous large mono- and multi-nucleated cells were present. There was no intracellular substance and no stroma other than thin-walled blood vessels and irregular strands of preformed connective tissue.

The scrotal tumour, with the exception of the hard nodule, was of this diffuse cellular structure and was practically all necrotic, except for a narrow band at the periphery. At several points the capsule was invaded. Just external to the teratoid mass were several well-preserved rete tubules.

Sections of the metastases showed mostly this diffuse lawless structure of anaplastic cells with varying amounts of necrosis. In the lung, however, there was a suggestion of alveolar arrangement and in the liver there were areas of typical adenocarcinoma lying in a diffusion of anaplastic cells.

From a study of the histological preparations the origin of the malignant tumour can be traced to the endodermal structures in the teratoid tumour situated in the upper pole of the testis, adjacent to the rete tubules.

We believe that the malignant tumour and metastases are all of endodermal origin, mostly of an undifferentiated cell type, but showing, as in the liver sections, a tendency to differentiate into glandular structures. In the absence of lymphoid stroma this tumour is not considered to be the well known embryonal carcinoma of Ewing but rather an undifferentiated adenocarcinoma with an endodermal origin in either the intestinal or respiratory epithelium.

The doctor sees all the weakness of mankind, the lawyer all the wickedness, the theologian all the stupidity.—Schopenhauer.

ANURIA DUE TO A LARGE HYDRONEPHROSIS*

Walter P. Hogarth, M.B.(Tor.), F.A.C.S.

Fort William, Ont.

Anuria or suppression of urine is a condition which often threatens the life of the patient and always causes much anxiety to the attending surgeon.

In my opinion the following case leaves many questions unanswered.

CASE REPORT

Mr. H.W., aged 43, was referred to me at one p.m. on June 1, by Dr. C. D. Archer. The patient stated that he had not voided since seven a.m. the previous day, a period of 31 hours, and then only a small quantity. He had had no lower abdominal pain but had vomited copiously several times during this period. He volunteered the information that the vomitus smelled like urine.

Past history.—The patient stated that he had been told four years previously that he had an inoperable tumour of the kidney. Since that time he had done no work and his family had drawn mother's allowance for support.

Though he was able to walk into the ward, the receiving nurse recorded that he was uncertain in his gait and extremely short of breath.

I found a man who looked anxious and quite ill. His tongue was thick and dry; his skin generally moist; his breath had a definite uræmic odour; his temperature was 99, pulse 88 and respirations 22. There was no suprapubic dullness, nor was any urine found in the bladder though a catheter was passed with ease. His abdomen was very prominent. Palpation revealed a large cystic mass which filled the entire right side of the abdomen and extended well past the mid line. It was tense but not tender. Palpation in the left loin elicited pain but the kidney could not be palpated.

He was given potassium citrate by mouth and fluids were forced. He was given 750 c.c. of 5% glucose solution intravenously. Linseed poultices were applied constantly to the loins and external heat was maintained by extra blankets. Following this, during the afternoon and night he vomited repeatedly and slept at intervals.

On the next morning the patient looked extremely ill. Catheterization showed the bladder still empty. An x-ray showed the shadow of a tumour mass filling the right side of the abdomen but no shadow of a calculus which might have been obstructing the left kidney was seen. He was given 50 c.c. of a 50% glucose solution intravenously and the linseed poultices were continued, the usually accepted treatment.

By mid afternoon his condition was considered grave; his temperature was 102.2, pulse 100, respiration 26. The patient complained of increasing pain in the left loin, which area was increasingly tender on palpation. It was apparent that more active intervention was indicated without delay. The increasing pain over the left kidney led me to the choice of direct surgical attack on the left kidney rather than more conservative cystoscopic measures.

The left kidney was exposed through the ordinary lumbar incision. It was distended, purplish in colour and tense on palpation. The pelvis and upper ureter were normal in size. There was no stone in the pelvis. A small incision was made in the cortex of the kidney and extended into the pelvis. There was moderately free bleeding from the kidney wound but there was no urine in the pelvis.

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*Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Urology, Montreal, P.Q., June 13, 1945.

A tube was passed through the kidney substance into the pelvis and secured. Packing was placed around the kidney and the wound closed around the tube. The patient reacted well and the dressings twelve hours later were wet with urine. It was noted that the abdominal tumour in the other kidney did not seem as prominent as on the previous day. He started to void on the night of the fourth and during the next 24 hours voided over 15 oz. This urine showed the presence of *B. Coli* on culture. On June 6 when I cystoscoped him, the bladder was negative, both ureters were catheterized easily, the pyelogram showed the tube in the left pelvis with an apparently normal pelvis and calyces. There was only a small amount of pyelographic solution in a small deformed right pelvis.

During the following week there was steady improvement in his condition. He was given several intravenous injections and the bowels were regulated. The packing was gradually removed. The urea nitrogen fell and became stabilized at 19 mgm. %. In spite of his voiding a satisfactory amount there was considerable drainage from the left kidney wound.

On June 15, or 13 days after the nephrostomy, the right kidney was exposed through a long oblique lumbar incision. Our recorded estimate of the size of the kidney was 15 x 8 x 8 inches. The fluid was evacuated and the kidney removed without undue difficulty. Though there was moderate postoperative shock, the patient rallied and ran an uneventful postoperative course except that the wound were rather slow in healing. The man was finally discharged from hospital on August 12 at which time the wounds were dry and union was firm.

During his hospital stay his Wassermann was found to be repeatedly positive. He later had a long course of treatment at the special treatment clinic without any embarrassment to the remaining kidney.

DISCUSSION

Anuria, as we have stated, is a condition that gives much anxiety to the surgeon. He must make an accurate appraisal of its underlying cause and apply prompt relief. Failure on his part will cost the life of his patient.

The exact cause of anuria in a given case is often a matter of doubt. A rather complete etiological classification has been recently reviewed by Mathe.[1] This is simplified into four main groups: (1) Prerenal (circulatory, infectious, toxic). (2) Renal (secretory). (3) Post renal (obstructive). (4) Reflex (which might be classed with group 2).

I am not yet sure just where the present case fits into this classification. Why should a man go at least four years with a large hydronephrosis and then develop a sudden and complete anuria without any apparent exciting cause? There was no evidence of circulatory failure. In reported cases of hysterical anuria references is always made to the finding of a small quantity of urine in the renal pelvis. In this case there was no urine in the left pelvis when opened.

I have had two cases with anuria due to a calculus obstructing the pelvic outlet in a solitary kidney. In these cases the calculi were removed through an incision in the pelvis and drainage provided by a T-tube. In both of these cases urine was dripping from the tube before the operative wound could be sutured. In the case under discussion no urine was detected for twelve hours.

Anuria is known to develop after some urethral manipulation. There was no such manipulation in this case.

When the left kidney was exposed at the first operation its appearance and tenseness closely simulated the appearance of a kidney once observed in a case of fulminating pyelonephritis. In the case under discussion when urine was recovered *B. Coli* were present on culture. However, his temperature chart and general condition did not indicate an acute infection.

We all read that there may be a reflex depressant effect exerted by a diseased kidney upon its healthy partner. Why should it occur in such a relatively harmless condition as a hydronephrosis and be so seldom recorded in connection with other more serious kidney lesions?

In the excitement and haste of the operation the escaping fluid was not measured. I have on another occasion recovered 110 oz. of fluid in a hydronephrosis considerably smaller than this one. Is it possible that some sudden increase in the size and tension of the hydronephrotic sac may have been the exciting cause? This view might be supported by the observation that the tumour was not as tense after urinary secretion was re-established.

Thomson Walker[2] in discussing hydronephrosis makes the following observation: "The secretion of this organ (the healthy kidney) is often reflexly depressed and complete anuria may supervene during the crisis of retention in the hydronephrotic sac."

This seems to me to be the only explanation for the case now being presented.

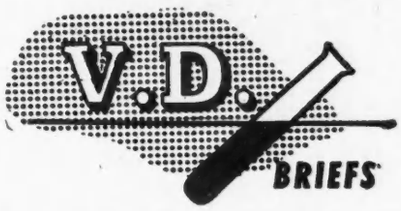
REFERENCES

1. MATHE, C. P.: Anuria, its differential diagnosis and treatment, *Urol. & Cutan. Rev.*, 49: 223, 1945.
2. WALKER, T.: Genito-Urinary Surgery, 2nd Ed., Cassell, London, p. 184.

131 S. Syndicate Ave.

The life of a man is a journey; a journey that must be travelled, however bad the roads or the accommodation.—Goldsmith.

Venereal Disease Campaign



Prevention of Spread of V.D. to the Civilian Population by Veterans of World War II

The following measures have been taken by the Canadian Armed Forces to prevent the spread of venereal diseases to the civilian population of Canada by Armed Forces personnel who are being retired or discharged from the Services.

1. *Case finding of syphilis.*—A serologic test for syphilis is done on all personnel of the Navy, Army and Air Force at the time of retirement or discharge. To ensure further follow-up, the names of all personnel with a positive or doubtful serologic test for syphilis are then submitted to the Division of Venereal Disease Control of the Health Department of the province where the former member of the Forces intends to reside.

2. *Prevention of spread of venereal infection.*—Personnel of the Navy, Army and Air Force who are found to have venereal disease in a communicable form at the time of their medical examination prior to retirement or discharge, are retained in the Service until they have received such treatment as may be necessary to render their infection non-communicable.

3. *Re-assessment of every syphilis infection.*—All personnel of the Navy, Army and Air Force with a history of syphilis infection, contracted either prior to or during their service, are given a complete medical examination for re-assessment of their syphilis infection. A summary of their case is then submitted to the Division of V.D. Control of the Health Department of the province where such personnel intend to reside. This summary of their case can, therefore, be made available by the Provincial Health Department to any physician who may be consulted by a former member of the Armed Forces for further medical care, observation and follow-up of a syphilis infection for which medical care was given in the Armed Forces.

"Find V.D. Contacts — Report V.D. Cases"

In life a friend may be often found and lost; but an old friend never can be found, and Nature has provided that he cannot easily be lost.—Johnson.

Clinical and Laboratory Notes

AN EMERGENCY CARRIAGE FOR THE IMMEDIATE TREATMENT OF SERIOUS CASUALTIES

By S./L. D. Christie, R.C.A.F.

Saskatoon, Sask.

The mobile "crash carriage" in the accompanying photographs was designed to make instantly available to the medical officer all equipment and supplies necessary for the immediate treatment of severe casualties. It has proved practical and useful in a small hospital or sick quarters where an operating room is not provided, and where a serious casualty is such a rare occurrence that difficulty is experienced in finding and assembling quickly supplies needed for treatment at the bedside of the patient.

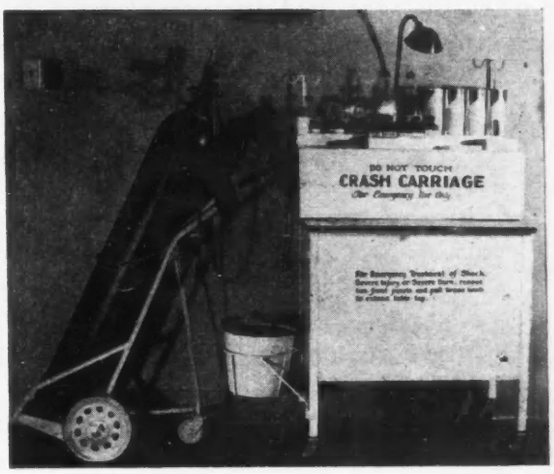


Fig. 1

On the arrival of a patient suffering from severe burn, shock, or injury, this carriage is ready for immediate use, no search for keys or supplies is required, there is no delay occasioned by the preparation of instruments and the medical officer is not dependent on any assistance. It may be that a saving of hospital beds is involved, as a "crash ward" need not be maintained since the mobile carriage and a mobile oxygen tank may be wheeled to any bedside in the hospital (Fig. 1).

If the accompanying photographs (Figs. 2 and 3) are referred to a detailed description of this emergency carriage is unnecessary. It should be noted that two adjustable intravenous stands are available, so that, if necessary, two patients may be treated at the same time. A goose neck electric lamp is incorporated in the carriage and an extension cord may be pulled from a small door and inserted into any wall plug. To use the carriage, two simple fasteners

Fig. 2

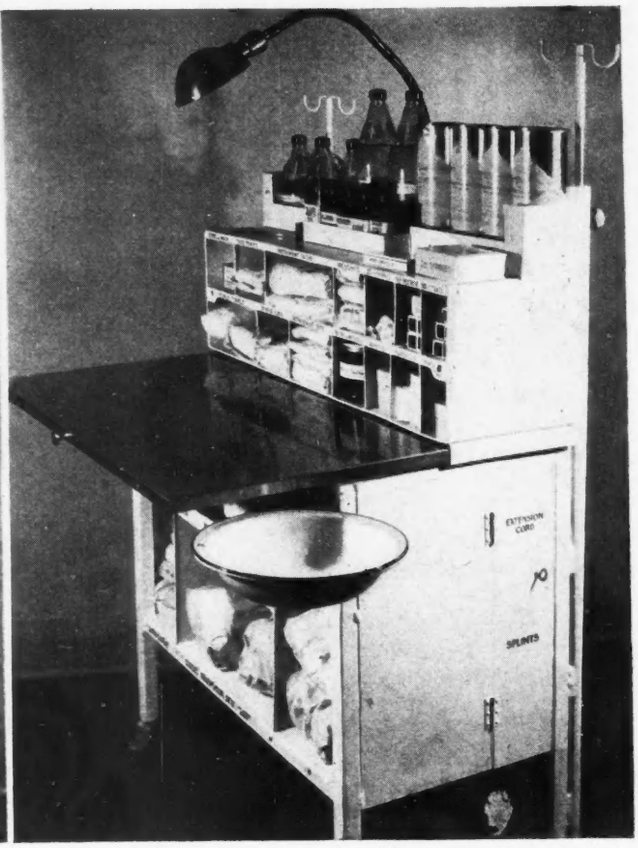


Fig. 3

are turned and the two front panels are removed, additional table space is provided by pulling the brass knob to extend the table top, the wash basin swings out from its position, and items to be used are readily identified by the plain printing on each pigeon-hole compartment. A complete list of the contents of the carriage is attached to the inner surface of the front panel and this list is initialled by the senior nursing sister at regular intervals, when an autoclave check is made.

This emergency carriage was built in the unit work shop from an ordinary dressing carriage. Number 16 gauge sheet iron is used on the lower, and number 20 gauge sheet iron is used on the upper part of the carriage. The sliding table top is of monometal number 18 gauge. The front edge of the partitions is reinforced by allowing three-eighths inch lap doubling back at 180 degrees. One-half inch right angle lap is allowed at the end of the shelves on the upper part of the carriage and rivetted to the sides. Bracket attachments are tubings three-eighths inch inside diameter. Welding is used for assembling.

It is suggested that other medical officers may wish to construct something similar for their own use and that they may find it useful in their hour of need.

CONTENTS OF THE EMERGENCY CARRIAGE

Four normal human serum, 2 normal saline 5% dextrose (500 c.c. size), 3 capsules nembutal gr. 1½, 4 ampoules of adrenalin, 5 lb. sulfathiazole emulsion, 4 intravenous sets (with Abbott bottle), assorted bandage, elastic bandages, adhesive, sterile gauze assorted, mercury manometer, stethoscope, 2 pounds cotton, assorted splints, 2 sterile packs, instruments, assorted sutures and needles, 2 kidney basins, 3 pairs sterile rubber gloves, sterile linen towels, 1 sterile drape, ether and mask, 6 sodium citrate 50 c.c. size, 2 pentothal sodium, 1 20 c.c. syringe, 1 2 c.c. syringe, 2 caps, masks and gowns, 4 distilled water (250 c.c. size), 4 ampoules of 50% dextrose, 1 tourniquet, bandage scissors, green soap, alcohol, metaphen, iodine, blood matching solution with slides and pipette, sterile tongue depressors, sterile applicators, pituitrin, coramine, large and small sterile basins, castile soap, penicillin, ampoule sod. sulfathiazole, tracheotomy tube, novocaine ampoules, laryngoscope, Magill tube.

I admire the habits of a physician; he sees the weakness of our nature; he is generally just and conscientious, though somewhat selfish, from the contempt which his profession must give him of mankind; his mind is rather accurate than exalted.—Lord John Russell.

THE CANADIAN MEDICAL ASSOCIATION

Editorial Offices—3640 University Street, Montreal

(Information regarding contributions and advertising will be found on the second page following the reading material.)

EDITORIAL

NATIONAL HEALTH SERVICE PROSPECTS IN GREAT BRITAIN

THE approaching developments in medical practice in Great Britain have been fully appreciated and discussed in all their phases. Their imminence has been accentuated by the change in the Government and the profession has now set forth the fundamental principles which it regards as essential in the framing of Government proposals for a national health service. These principles and their preamble, in a pattern not unfamiliar to us, are as follows:

"For a quarter of a century the medical profession has stressed the need for a complete health service.

"The profession is willing and anxious to co-operate with the Government in evolving this service, for it believes that the knowledge and experience of the profession are indispensable contributions to its success.

"It re-emphasizes that good housing and social, economic, and environmental circumstances are the principal factors in the maintenance of health and the prevention of disease. It urges the expansion of medical research.

"In the interests both of the public and of medicine the profession regards the acceptance of the following principles as essential:

"I. The medical profession is, in the public interest, opposed to any form of service which leads directly or indirectly to the profession as a whole becoming full-time salaried servants of the State or local authorities.

"II. The medical profession should remain free to exercise the art and science of medicine according to its traditions, standards, and knowledge, the individual doctor retaining full responsibility for the care of the patient, and freedom of judgment, action, speech, and publication, without interference in his professional work.

"III. The citizen should be free to choose or change his or her family doctor, to choose, in consultation with his family doctor, the hospital at which he should be treated, and free to decide whether he avails himself of the public service or obtains independently the medical service he needs.

"IV. Doctors should, like other workers, be free to choose the form, place, and type of work they prefer without Governmental or other direction.

"V. Every registered medical practitioner should be entitled as a right to participate in the public service.

"VI. The hospital service should be planned over natural hospital areas centred on universities in order that these centres of education and research may influence the whole service.

"VII. There should be adequate representation of the medical profession on all administrative bodies associated with the new service in order that doctors may make their contribution to the efficiency of the service."

Apparently, the Government has not yet finally decided what proposals it will submit to Parliament, but warning has been given that as a preliminary step legislation is being planned for the abolition of the procedure of selling and buying medical practices, due compensation to be provided. This procedure seldom obtains in Canada and in itself is of no special interest to us. What is worth noting is the policy of the Government to gain control of the distribution of doctors, towards which end this move is preparatory.

This is all of great interest to any country which must face sooner or later the intervention of Government in the distribution and operation of health services: and what country is not in that position? In Canada we are in a stage of anticipation. So was Great Britain until a few weeks ago. Now their uncertainty is being resolved in a concrete and not entirely welcome form of planning, containing a definite element of compulsion. It is not enough to say that our problems in Canada are different and that our solution of them will be more gradual. "Gradual" means by steps, and we like to think that those steps will be not only deliberate but that they will be in a direction that we prefer. Governments however, quite apart from the uncertainty of their complexion, have a way of choosing the direction themselves and what is more, of enforcing their choice.

At the moment our Government has declared no policy beyond the very worthy objective of providing the best of health services for the Canadian people. We too have put forward no definite scheme beyond supporting the principle that the best quality of service must be aimed at and fair conditions of work maintained. But let no one think that developments in the control of medical practice will not come sooner or later. The profession should play its part in guiding these, and to do that we must first make up our minds as to what we want.

In the mountains the shortest way is from summit to summit; but for that thou needest long legs.—Nietzsche.

Editorial Comments

Modification of Codeine Prescriptions

The Department of National Health and Welfare has announced a welcome amendment of the Codeine Regulations effective at the beginning of 1946. Physicians are now relieved from the necessity of providing prescriptions for preparations containing one-eighth of a grain or less of codeine per tablet or other solid form, or liquid preparations containing one-third of a grain or less of codeine per fluid ounce, when such preparations are combined with other medicinal ingredients and the maximum dose prescribed contains these ingredients in the amounts laid down by the circular issued to all physicians and druggists.

The Regulation regarding the sale and use of Codeine as established by Orders in Council remain unchanged in other respects.

Health Week, February 3 to 9, 1946

Benjamin Disraeli said that the health of the people is "really the foundation upon which all their happiness and all their powers as a State depend".

In this connection it is interesting to note that today sickness, much of it preventable, is costing Canada, directly and indirectly, an estimated billion dollars annually—an appalling sum for any nation, much more for one which appears destined to become one of the leading countries of the world.

To draw attention to this waste, economic and otherwise, the Health League of Canada, leading voluntary health education organization in the Dominion, has designated the week of February 3 as "Health Week"—an observance dedicated to national, community and personal health.

It is imperative that Canadians become and remain health conscious. The state of public health is steadily improving because of enormous strides made in the field of preventive medicine, but even proved methods of prevention cannot succeed without the co-operation of the citizens at large.

For instance, milk-borne diseases still are common despite the fact that pasteurization, a simple procedure, removes harmful germs, and diphtheria is still taking a toll of Canadian children despite the fact that harmless toxoid is a proved preventive agent. These are just two instances, but there are still many citizens of this nation who continue to ignore the facts. Many do not seem to grasp the simple statement that "health is a priceless asset". It must be guarded continually through preventive and other commonsense methods if personal suffering, frustration, poverty, broken homes and public relief are to be eliminated.

A special feature of "Health Week" is "Social Hygiene Day"—February 6. This day is set aside to draw attention to the fact that despite all efforts of official and voluntary agencies, venereal diseases today constitute as serious a problem as ever. That there must be no easing in the fight against the VD menace is obvious.

Medical Economics

Agreement between the Dependents' Board of Trustees and the Canadian Medical Association

We are now able to announce the conclusion of arrangements with the Dependents' Board of Trustees (D.B.T.) regarding payment for the care of dependents of the members of the armed forces. The delay in this final agreement has been due to the desire of the C.M.A. Committee to have this medical care provided along lines parallel with those which are being employed in the medical care of veterans. The formal memorandum for arrangements will be found at the end of this article. It will be noted in paragraph 10 that "this memorandum will come into effect as soon as possible after the publication of the schedule of fees on a date to be determined by the D.B.T."

The schedule of fees adopted by the D.V.A. has been accepted; but, under the special circumstances which govern our relationship with the D.B.T., your committee has agreed to a discount of 20% on each individual item of the tariff which exceeds $10.00. It is understood that where an account contains a number of items, each of which is under $10.00, the gross amount will not be affected by the discount.

Reference to the terms of arrangement will show that the parallelism between the two plans lies, not only in their following the same schedule of fees, but also in their having the same set of medical advisory committees across the country to assist with their advice regarding professional matters. It will also be seen that the Association does not expect to continue this special discount after the disbanding of the D.B.T.

It should be emphasized once more that the delay in concluding this agreement has arisen entirely from the desire on the part of your committee to avoid the confusion of multiple arrangements and not from any inactivity on the part of the D.B.T.

There are three points which require clarification, and the following is a statement of the policy pursued by the D.B.T. in dealing with them.

1. *Payment for medical services in voluntary hospitals.*

From the point of view of the D.B.T., voluntary hospitals are those in which no professional fee is payable by any person who is in the general (public) ward at his own charges. The fact that doctors are permitted to charge patients who are under Workmen's Compensation or Industrial Insurance is not regarded as removing the hospital from the voluntary classification. In this group of hospitals the doctor is not expected to present a bill for his services for D.B.T. cases.

2. *Provision for private or semi-private accommodation for patient coming under the D.B.T.*

Patients being assisted by the Board are regarded as unable to meet the charges of medical and hospital care, either in whole or in part. They are therefore expected to accept general ward accommodation and not to ask for semi-private or private rooms. If the doctor feels that for medical reasons the patient's life would be endangered, or if there were some medical reason why it would be undesirable to have a patient in a general ward—such as infection, mental condition, etc.—he may recommend transfer to some other accommodation. But under these circumstances the same ruling regarding fees as mentioned in paragraph 1 would apply.

3. *Assistance is only given by the D.B.T. to dependents of those who are actually serving in the armed forces at the time the application is made.*

After discharge any assistance of this kind is not the responsibility of the Board. Considerable importance, therefore, attaches to the date of receipt of applications for the assistance, and their relation to the date of discharge from the services. The policy of the Board is to accept for consideration cases in which either a letter signifying the intention to apply for assistance, or a completed form of application, is received at the office of a regional advisory committee, prior to the date of discharge, or showing that obviously it has been mailed prior to that date. When these requirements have been satisfied the Board will reserve the right to investigate each case in the usual way to determine whether or not responsibility for its care will be accepted. The Board cannot accept responsibility for the care of a dependent if this application for assistance has not been made before the date of discharge.

MEMORANDUM OF ARRANGEMENTS BETWEEN THE DEPENDENTS' BOARD OF TRUSTEES AND THE CANADIAN MEDICAL ASSOCIATION CONCERNING THE HANDLING OF ACCOUNTS IN RESPECT TO MEDICAL AND SURGICAL SERVICES RENDERED TO DEPENDENTS OF MEMBERS OF THE ARMED FORCES.

1. This Memorandum of Arrangements and the Schedule of Fees approved by the Department of Veterans' Affairs for the Medical Care of Veterans ("Schedule of Fees"), are agreed upon by The Dependents' Board of Trustees ("The Board") and the Canadian Medical Association ("C.M.A.") to be applicable where payment is to be made by the Board in respect to medical and surgical services rendered to dependents of members of the Armed Forces.

2. The Board and the C.M.A. are agreed that in respect to accounts which the Board accepts for payment in whole or in part, each individual item in the Schedule of Fees in excess of $10.00 will be subject to a deduction of 20% from the listed amount.

3. The Board will not accept automatic liability for payment of accounts for medical and surgical services, but will continue its present practice of investigating individually applications made by qualified dependents and of determining as a result of such investigations if, or the extent to which, assistance will be granted by the Board in respect to such accounts. Applications for such assistance will be accepted for consideration by the Board only if made voluntarily by dependents.

4. Where payment is to be made by the Board in respect to an item not included in the Schedule of Fees, the maximum amount payable in respect to such item will be determined by the regional Dependents' Advisory Committee on the advice of its Medical Advisory Committee.

5. Where the Board accepts an account for payment in full or in part, the maximum amount to be paid by the Board alone, or by the Board and the dependent or any others jointly, will be the account as rendered to the dependent, but such maximum will not exceed the amount set out in the Schedule of Fees and adjusted as provided in paragraph 2 hereof.

6. Notwithstanding the provisions of the preceding paragraph, any regional Dependents' Advisory Committee, on the advice of its Medical Advisory Committee, may recommend to the Board, in respect to any individual account, that the amount established in accordance with this Memorandum of Arrangements be increased on any specific item or items where exceptional circumstances are deemed to warrant such action.

7. Where the total amount received or to be received by a doctor from the Board or from any other source in respect to an account (for medical or surgical services) accepted by the Board for payment in whole or in part is less than the full amount of the account as established in accordance with this Memorandum of Arrangements, the doctor will be free to collect the deficiency from the dependent.

8. Where full settlement of an account is to be made and accepted in an amount less than that billed by a doctor to a dependent, or if only partial payment of an account is to be made by the Board, payment will be made by

the Board direct to the doctor, with notification to the dependent only to the effect that the account has been settled in full, or that it has been paid to the point of leaving $ —— payable by the dependent.

9. A medical Advisory Committee will be appointed for each regional Dependents' Advisory Committee by the appropriate Provincial Division of the C.M.A. after consultation, when necessary, with other interested organizations, to act as an Advisory Committee on matters of mutual interest between the regional Dependents' Advisory Committee and the medical profession, and as provided in paragraphs 4 and 6 hereof. The C.M.A., through the respective Provincial Divisions, will accept responsibility for such Medical Advisory Committees, and the regional Dependents' Advisory Committees will furnish such secretarial service as may be necessary in respect to the activities of such Medical Advisory Committees under this Memorandum of Arrangements. It is agreed, however, that wherever possible the said Medical Advisory Committees will be identical with the Committees to be appointed by the C.M.A. for liaison purposes with the Department of Veterans' Affairs, with the addition, at the discretion of the Chairman of the appropriate regional Dependents' Advisory Committee, of a representative of the Board to each such C.M.A.-D.V.A. Committee.

10. This Memorandum of Arrangements will come into effect as soon as possible after publication of the Schedule of Fees, on a date to be determined by the Board, and will be subject to revision on six months' advance notice by the Board or the C.M.A. Nothing herein contained is to be construed as committing the C.M.A. to continue the discount provided in paragraph 2 hereof to any Government body or department which may act hereafter as the successor of the Board.

Men and Books

HIGHLIGHTS IN THE HISTORY OF THE BOSTON LYING-IN HOSPITAL*

By Frederick C. Irving, M.D.

Boston, Mass.

In 1832, when the Boston Lying-in Hospital was founded, Boston was a city of 40,000 odd souls, perched upon a hilly peninsula and connected with the United States only by a narrow strip of land and seven bridges. If a Bostonian wished to visit New York, and few did, he took a coach to Providence, Norwich or Hartford—for there was no railroad until 1835—and there embarked in a steamboat, arriving at his destination in 24 to 36 hours. At the time this story begins Andrew Jackson had been elected President for a second term, and most people of this city could see in the victory of a Democrat nothing ahead for the country but disaster, or even dissolution of the Union. The streets were paved with cobblestones, the houses were lighted with candles and whale oil lamps, a public water supply from Lake Cochituate had just been finished, but the old families regarded it as newfangled and still stuck to their backyard pumps.

In medicine blood-letting, leeching, and purging were in high repute; a patient in those days needed stamina not only to conquer his disease but also to survive his treatment; there were no clinical thermometers, no blood-pressure machines, no examinations of the urine, no antiseptics; anæsthesia was still a dream of the future.

If those of us who are here tonight had lived in Boston then and had read the newspapers on September 29, 1832, we would have found in the *Christian Register*—a journal devoted, according to its heading, to "Unitarian Christianity, Sound Morals, Literature, and News", apparently in the order of their relative importance—the following notice:

> ***"The Boston Lying-in Hospital.*** **This institution we learn is completely organized, and is ready for the reception of patients. An estate has been purchased, situated in the southerly part of this city, at No. 718 Washington Street, embracing a house well adapted to its present purposes, and a spacious lot of land which will admit an extension of its buildings, whenever it shall become necessary. No patient will be recommended for admission unless a married woman or one recently widowed, and known to be of good moral character."**

To explain how the Hospital came to be founded it is necessary first to describe briefly an ancient and curious organization in old Boston known as the Massachusetts Charitable Fire Society. In the days of wooden buildings, before the beginning of the nineteenth century, fires were frequent in the city, and, since there were no insurance companies, the losses were often heavy. The purpose of the Fire Society was to aid with gifts of money families thus left destitute. By 1830, however, some time after laws had been passed requiring that all new houses be built of brick, and following the establishment of insurance companies, the Society found itself with a surplus of over $20,000. The first of a memorable series of dinners, which has continued to the present day—for the Society became later a social rather than a strictly charitable organization,—was held on May 29, 1832, at the Norfolk House in Roxbury. At this meeting the Fire Society decided to give $5,000 to establish a hospital for poor women in childbed, and the Boston Lying-in Hospital was conceived that night. It requires no great imagination on our part to identify

*Read at the Annual Dinner of the Canadian Gynæcological Travel Society, Boston, November 3, 1945.

Dr. Walter Channing as the originator of this project, for since he was a friend of all of the members of the Society, he undoubtedly knew that they were looking for a project on which to spend their money. An equal amount was obtained from the Massachusetts Humane Society. In recognition of these benefactions these two organizations have been permitted to appoint annually two members each to our Board of Trustees. Five years ago the Humane Society at last withdrew, stating that since the Hospital could now be regarded as fairly well established, it seemed no longer necessary to exercise any oversight upon its welfare.

With this $10,000 the Trustees bought a small brick dwelling on Washington Street from Michael Hunting, a dealer in rum and molasses. It was situated at the beginning of Roxbury Neck, then only two streets wide—for the Back Bay has not been filled in—on the outskirts of Boston near the Dover Street Bridge. One end was toward the street, from which it was separated by a white picket fence, and it faced a large garden where the matron raised cabbages, lettuce, and squash which were sold to help support the Hospital.

The founders of this small institution, the first of its kind in New England and one of the first in America, were Dr. Walter Channing and Dr. Enoch Hale, Jr. Dr. Hale made no great stir in the obstetrical world, but Dr. Channing was in this country one of the most eminent medical men of his time. He was born in Providence in 1786 of an old and extremely respectable New England family, being a grandson of William Ellery, a signer of the Declaration of Independence. He entered Harvard College in 1804, but left in 1807 at its request because of his involvement in a students' rebellion. Later, when he was on the road to eminence, the College forgave him and he was granted his degree as of 1808. He studied medicine under Rush, Wistar, and Physick at the University of Pennsylvania. After a time spent as the pupil of James Jackson of Boston he went to London and Edinburgh for a year, devoting his attention largely to obstetrics: thus his training was far superior to that of anyone of his time in New England and he was soon recognized as the ablest obstetrician in Boston.

In 1818 he was appointed the first Professor of Midwifery and Medical Jurisprudence at Harvard Medical School,—or the Massachusetts Medical College, as it was then called,—a position which he held for 36 years. Obstetrics is the fourth oldest department in the Medical School; only Anatomy and Surgery, Theory and Practice of Physic, and Chemistry were established before. The chair of obstetrics has always been a comfortable one, for during the 127 years of its existence it has been occupied by only 8 professors, which would indicate either that they were of considerable longevity or that they were difficult to dislodge. Dr. Channing was also the first Dean of the School, a position he held until 1847, when he was succeeded by Oliver Wendell Holmes.

As a teacher Dr. Channing was vivid and entertaining. One of his pupils describes him thus:

> "He came fresh from his morning drive, bright, cheery and in the best of spirits. The first impression was a favourable one. He was a fluent, at times an eloquent speaker. He graphically described the bones of the female pelvis and clothed them with flesh and blood; he was full of anecdote; his manner was pleasant and interesting. The lecture reminded one of a fresh easterly breeze on a dry, hot summer day. The hour passed rapidly away; he briskly put on his coat and disappeared as suddenly as he came, leaving us almost spellbound."

Dr. Channing was a man of medium height, with blue eyes, a prominent nose, and a florid complexion. He had a quick temper, which, however, he usually managed to control. Like all physicians of his time he wore a beaver hat, a tailed coat, a ruffled shirt and a black stock. The brother of William Ellery Channing, the famous Unitarian divine, he was deeply religious and a complete teetotaler. It cannot be said, however, that in these respects he set a permanent tradition in the department.

Not only is Dr. Channing to be venerated because he founded this hospital, but he is justly celebrated in American medicine for two outstanding contributions. He was the earliest American advocate of anæsthesia in labour. In 1848 he published a book on the subject entitled, *A Treatise of Etherization in Childbirth, With a Report of 581 Cases.* The first woman in the United States to be given an anæsthetic in labour was a resident of Boston and the ether was administered on April 7, 1847, by Nathan Cooley Keep, a dentist, who was also the founder and the first Dean of the Harvard Dental School; but the first operative delivery under anæsthesia, a craniotomy, was performed by Dr. Channing on May 5. The first woman in an American maternity hospital to receive an anæsthetic was Catherine Fisher, who was given ether in the Boston Lying-in Hospital on September 16, 1847, eleven months after its first public demonstration at the Massachusetts General Hospital. The obstetrician in charge was Dr. Charles Gideon Putnam, who succeeded Dr. Hale. Thus began a tradition concerning the relief of pain in labour which this institution is proud to carry on. Dr. Channing first described the pernicious-like anæmia of pregnancy. In 1842 he reported 10 cases of the disease, and he even suggested the possibility of the transfusion of blood for its relief.

Dr. Channing lived to be 90 years old. When he died it was said of him, "He served well his day and his generation; the end of his life was peaceful; he has left behind a pleasant memory."

The first patient, Mary Connor, had entered the old hospital on Washington Street on October 24, 1832, and was confined on December 8. The original hospital continued in operation for 22 years, in which time there had

been 650 deliveries, an average of only 27 annually. By 1854 the old house had become dilapidated and needed extensive repairs. The trustees bought a lot on Springfield Street and constructed a "magnificent edifice" of 50 beds. In two years, however, they were at the end of their financial rope and had to close its doors. They disposed of the building to the City of Boston for use as a city hospital. No sooner had they done so than the neighbours sneaked a bill through the legislature making it illegal to maintain a general hospital within 300 feet of a school house, and the City found itself with a white elephant on its hands, for there was a school house next door. After many vicissitudes it became the Home for Aged Men, which it is today.

The chief figure of the Springfield Street era was Horatio Storer, who was assistant attending physician and the stormy petrel of Boston medicine. A former assistant of Dr. James Y. Simpson, he returned to Boston to practise gynæcology as well as obstetrics, firmly convinced that chloroform was better than ether. He immediately became unpopular on both counts. To Boston ether was the sacred essence, whose fumes had wafted the fame of the Massachusetts General Hospital to the corners of the earth, and while it was recognized that there were certain "diseases peculiar to women" it was considered even more peculiar to say or do much about them. Storer was a person of great ingenuity and an absolutely fearless operator. He used rubber gloves 15 year before Halstead—who is supposed to have invented them—not to protect the patient but to safeguard his own hands from infection. Although he knew nothing of antisepsis, he hung sheets wrung out in carbolic acid solution about the operating room, because he felt that it purified the air. On July 21, 1868, he performed the first Porro operation 8 years before Porro, and the patient lived 30 hours. This operation occurred not in the Lying-in Hospital but in the 'patient's home. Finally, this remarkable man is to be remembered because he was the first in America to teach gynæcology as a separate specialty.

In 1872 the trustees delegated Dr. Henry Tuck and Dr. William L. Richardson to reopen the Hospital after its sixteen years of closure and they bought the house at 24 McLean Street for the purpose. The first patient was admitted on January 6, 1873, and delivered on January 12. The first year there were 160 births. Last year in the present Boston Lying-in there were 4,716.

There are three persons to whom the recreated Hospital owes much, and who are to be remembered as its worthies following its revival. One is William L. Richardson, the chief of staff for many years, the second is Mrs. Higgins, the matron and first superintendent, and the third is Alfred Worcester, probably the most extraordinary house-officer the hospital has ever had, and who is today one of its oldest living alumni.

William Lambert Richardson, had learned his obstetrics at the Rotunda Hospital in Dublin, where he lost an eye when examining a woman with gonorrhœa. Unlike Channing or Storer, he made no great direct contribution to obstetrics. Although reactionary by instinct, he was enthusiastic when the innovations made by his younger men turned out well. He encouraged George Haven to perform the first Cæsarean section on July 15, 1894. The patient was Edith Fletcher, who had a true conjugate of 6.25 cm. and had lost two babies through the pelvis. Medically trained, Dr. Richardson never performed a Cæsarean himself. Although he first opposed, as we shall see, the introduction of the antiseptic technique, once it had become established and proved to be of benefit, he wrote a classic article upon it.

As a lecturer in the Medical School he was forceful and dramatic. All of the other professors taught from the pits of amphitheatres, but not Richardson. A former star in the Hasty Pudding Club Plays in Cambridge, he had a stage built in the new medical school, so that he might display his histrionic talents. From this vantage point he would lecture to the students, and having removed his coat and rolled up his sleeves, he would show them just how to dilate the cervix in placenta prævia, a a manœuvre which fascinated his students, but which today would impress us as exceedingly bad obstetrics.

Eliza Jane Anne Higgins was matron and superintendent of the Boston Lying-in Hospital for 41 years. She began her duties with Dr. Richardson in 1873 and resigned in 1912. She was an English woman of the Victorian era with a slight Cockney accent, an accomplished midwife, and with indomitable courage in times of stress. If Dr. Richardson was the father of the present hospital, Mrs. Higgins was its mother, for she nursed the recreated institution through 3 epidemics of puerperal fever, each one so bad that it had to be closed, saw it survive a feeble infancy and grow to healthy adult age.

Half the patients in her early days were unmarried and were either ignorant immigrant girls, or trollops, trulls and tarts. For the first 5 years 52% of the patients were unmarried; in the last 5 years only 2%. Since birth control is illegal in Massachusetts a simple arithmetical calculation will convince you that Boston women of the present day are twenty-six times more moral than were their great-grandmothers. The first patient admitted, illegitimately pregnant for the second time, on her discharge was arrested as a common vagrant and sent to the prison on Deer Island. Another woman, awaiting confinement, was allowed to accompany a patient just discharged to the

street car at the corner, and returned roaring drunk, thus showing what could be accomplished in those days in a restricted area of Boston in a short time. One night the cook came back after a day of relaxation and passed away at the foot of the front stairs. Being a woman of large bulk, she effectively blocked communication with the upper stories so that the nurses and doctors were compelled to use the back stairs.

Mrs. Higgins kept a diary in which she noted interesting cases. Bessie Nickerson delivered herself while alone on the water closet, which should please those who believe in the virtue of early baptism. The baby of Minnie Smith had been pronounced dead *in utero* when she entered the hospital, yet it screamed lustily when it was born; apparently the doctors had been wrong. The infant of Christine Magimus was heard to cry in its mother's uterus—Mrs. Higgins and others heard it. Legend says the same of Mohammed and St. Bartholomew. Although there are 60 actual cases of *vagitus uterinus* in the literature, all will agree with Mrs. Higgins that it is a "remarkable phenomenon".

Alfred Worcester was house-officer in 1883, a time when puerperal sepsis was endemic in the Hospital. For the past 5 years every other woman who had entered had contracted the disease, and one in every twenty of those who had entered died. The Hospital had just been closed for the third time in 4 years. Upon this scene arrived Rufus Kingman of Providence, a former house-officer, who had just returned from abroad. He told Worcester of the brilliant results obtained by Breisky of Prague, who by scrubbing his hands and using antiseptics, had the year before succeeded in delivering 1,100 women without a death from childbed fever. Impressed by this news, Worcester obtained a supply of bichloride of mercury solution and scrubbed his hands with it. Soon a considerable improvement ensued; to be sure puerperal sepsis was not completely stamped out, but there had been no deaths.

One morning Dr. Richardson was making rounds and noticed a basin of this solution containing a nail brush on a table beside a woman who was about to be delivered.

"Young man," said he, "what is in that basin and what is that nail brush for?"

"That, Sir," replied Worcester, "is a solution of bichloride of mercury to scrub my hands with before making a vaginal examination." Somewhat apprehensive and talking rapidly he went on to tell his chief of the excellent results obtained abroad by the use of antiseptics. Dr. Richardson regarded him severely with his one good eye, while his glass one assumed an unusually baleful appearance.

"You damned fool. Throw it out of the window. The next thing I know you will be scrubbing the patients with it." This gave Worcester an idea, which he at once put into effect. Since Dr. Richardson soon left for Europe and the assistant, Dr. Boardman, was spending the summer in Hull, Worcester had things much to himself. He applied the bichloride liberally to himself and to the patients, and the house-officers who followed him did likewise. Deaths from sepsis became a rarity, and there have been no epidemics since. Although Dr. Richardson had at first forbidden the use of antiseptics, he soon became an enthusiastic convert, and in 1887 he published his article entitled, "The Use of Antiseptics in Obstetric Practice". This paper was probably his greatest contribution to obstetric literature, and was the second of its kind written in America, being antedated only by that of Garrigues of the New York Maternity Hospital of the year before. Soon the change to aseptic methods followed the advances in general surgery, an autoclave was installed and instruments were boiled. Rubber gloves were first used as a routine by Dr. Franklin S. Newell in 1903. Although Holmes in 1843 and Semmelweiss in 1847 had preached the infectiousness of puerperal fever, 40 years had elapsed before its prevention had been put upon a practical basis. Many still held to the theory of sewer gas, miasms, and pestilential vapours, and the bad influence of such men as Meigs of Philadelphia still held sway. Moreover, no one knew anything about antiseptics until Lister in 1865 obtained startling results in surgery by the use of carbolic acid, nor anything about the rôle of bacteria until Pasteur in 1873 identified the streptococcus as the cause of the most virulent form of puerperal fever. In 1876 Bischoff of Basle applied Lister's method to obstetrics, which, imitated by Breisky of Prague, was handed on by Kingman to Worcester at the Boston Lying-in Hospital. In lying-in hospitals the pestilence that walketh in darkness and the destruction that wasteth a noonday seemed gone forever. Such a triumph greatly delighted Dr. Oliver Wendell Holmes, who was then an old man. Said he, "But I think I shrieked my warning louder and longer than any of them, and I am pleased to remember that I took my ground on the existing evidence before the little army of microbes was marched up to support my position."

In 1918, Dr. Franklin S. Newell became chief of staff and in 1923 the Hospital moved to its present building on Longwood Avenue. Dr. Newell was the first chief who had been surgically trained and who brought the point of view of the general surgeon to his obstetric problems. His work on Cæsarean section was outstanding, as were his contributions to our knowledge of heart disease, which affects so many pregnant women in New England. With Dr. Hamilton, he established one of the first obstetrical cardiac clinics in the country, where over 1,000 women with rheumatic heart disease have been treated. But those of us who were privileged to work under him will remember best his honesty, his

kindness, his unerring judgment and his devotion to his patients. In the 113 years of the hospital's existence, there has been no one who possessed these priceless qualities in a higher degree.

Compared with the situation of a century ago, the infantile death rate today in our Hospital is only one-half of what it was, and the maternal mortality less than one-fifteenth. Many practical gifts of lasting value have been made to obstetric medicine. Hæmorrhagic disease of the newborn was first described by Townsend of this Hospital, and the first water heated bassinet in America was devised by Kingman, a house-officer in 1880. Scientific investigations have always been planned so that they might prove of practical benefit to the patients. Outstanding among these have been the work of Thomson and Cohen on the circulation in pregnancy and that of Chandler and Janeway on the treatment of puerperal sepsis with sulfanilamide and immunotransfusion. Hertig of our staff has discovered and described two of the earliest human ova in existence. The constant aim of the Hospital has been to improve its results by review of its own cases, or by the adoption of methods learned from other institutions, if they seemed better than its own, for self-satisfaction has no place in the conduct of a modern maternity hospital.

In the 113 years of its existence 550 house officers, 8,000 medical students and 6,500 nurses have been trained at the Boston Lying-in Hospital. Every fourth baby born in Boston is delivered under the auspices of this institution. Since its founding in 1832, 170,703 patients have been cared for in its various departments, which, you will agree is a very large number of women.

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The work done by the Council of the Association during this past year has involved consideration of a slightly smaller number of cases than has been usual in the past few years, but has been more difficult because many cases had complications caused by thoughtlessness or fear of members when they first found themselves in trouble. Doctors commonly are not involved in legal troubles and when trouble arises they seem to lose their judgment on receipt of the first threat.

One case which came to trial this year had two causes, either of which was avoidable had the doctors used common sense and judgment. A patient needed cholecystectomy and was admitted to hospital. No recent physical examination had been done, the records the doctors were able to produce were of the sketchiest kind and while the doctors' knowledge of the patient may have been sufficient, they certainly were unable to demonstrate this satisfactorily when the need arose. A spinal anæsthetic was decided upon and an attempt was made to give it. Difficulty was encountered before it finally was successful. When the position of the patient was being changed immediately preparatory to surgery her death occurred.

At the inquest and subsequent trial nothing wrong with the medical investigation or proposed treatment was shown and it is very doubtful whether anything more than an inquest would have followed the death had two things wrong not combined to cause the suit. The doctors had failed in an elementary precaution, they did not write a history or physical examination before operation and they were careless and unfortunate in their discussions with the patient's family. In his reasons for judgment the judge said:

> "I am convinced that there is little likelihood that this action would have been commenced but for Dr. . . .'s unsatisfactory answers at the time of the inquest and for an unfortunate remark he made to the plaintiff on another occasion, probably when both parties were in an agitated frame of mind. Dr. . . .'s failure to fill in the chart on Mrs. . . .'s case until after her death must also have contributed to this litigation."

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Doctors should not be too ready to accept blame for accidents that happen in spite of them. Not all results can be good. Some bad results will occur in spite of the most adequate investigation and careful treatment. This is just as true about serious accidents such as this anæsthetic death as about cases with less serious results. When discussing poor results doctors should not accept blame too easily. They should state the explanation to the responsible persons

as fairly as possible but not in such a way as to attach blame to themselves when no such blame exists.

In this case both things were wrong. The doctors' records were most incomplete and their remarks were most unfortunate. However, it was shown at trial that neither of these facts influenced the outcome of the case and our members secured a favourable judgment. They did have, however, the trouble and worry of a suit which was wholly unnecessary and which was, in the final analysis, their own fault.

2. Make no Financial Settlements Without Legal Advice

Also during this year one of our members wrote us that following a hysterotomy which had to be performed under emergency conditions, the patient's recovery was incomplete. Some four months later she was seen by two other surgeons who, on rectal examination, found a foreign body — apparently a sponge ring— protruding into the rectum. At a later examination under spinal anæsthetic the ring was found to have advanced sufficiently into the rectum that it was possible to remove it. The surgeons in question gave the ring to the patient! When she returned home she and her husband presented the doctor with an account for their expenses. The amount due the hospital was payable immediately and the doctor paid it. He then wrote the Association asking what he should do about the remainder of the expenses and was advised that having paid the hospital expenses, and in view of his earlier statement that at the end of the operation he had been informed by his nurse that the sponge count was correct, he should refuse all further payment. However, it was learned later that in spite of this advice, when the patient began threatening, the doctor paid the whole account. Nearly three months later the doctor wrote informing the Association of this fact and asked to be reimbursed for the whole amount.

The Association has stated repeatedly both in letters to members and in its annual reports, that as a matter of policy it cannot hold itself responsible for expenses incurred without its approval or against its advice. A little thought will show the reasonableness of this policy. No organization providing financial help could remain solvent if it held itself liable for all expenses incurred by members acting without advice and approval. Another thing is true. Patients in the heat of the moment are inclined to collect as large an amount as they possibly can. Doctors, in the stress of the moment, are disinclined to quibble over the amount. The result is that in most cases the amounts paid under such circumstances are very much larger than they need be. Members must remember that, if they expect assistance, they must notify this Association on receipt of the first threat and before making any promises, then they should accept the advice given by the Association about the conduct of the case.

The Association exists for one purpose only— to assist its members in trouble. Very often members with little or no medico-legal knowledge or experience feel that the advice of the Association actually may increase their troubles. This is seldom the case. The actions advised may increase the tension of the moment while, and this is more important, laying the foundation for ultimate fair settlement. Members of Council have had years of experience dealing with incipient legal trouble, our General Counsel has had wide experience and the advice is given objectively with reference to the case as a whole and without the pressure and the fear which commonly exist for the doctor. If the case develops and goes to trial not only do members get assistance throughout but the trial, while more bothersome, may be in the doctor's best interests.

In the case under discussion there was reasonable doubt whether the responsibility belonged to the doctor, and the doctor, after making the payment, did not obtain a release which would protect him against further demands in a court of law. Therefore the Association was unable to hold itself responsible for any future expenses. However, after considerable discussion it was decided to offer the doctor about half the amount he had paid the patients, this amount to be paid the doctor only after the Statute of Limitations protects him from further demands.

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Still another case caused the Council of the Association considerable worry. A doctor practising near the International Boundary was consulted by a parent whose child had had an injury to one arm. A fracture was demonstrated by x-ray and because of swelling at the time it was decided that final reduction should be deferred. The patient returned to her home in the United States and did not consult our member again. Later however, a writ from a United States court was issued against our member and our member requested assistance.

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necessary to inform our member that the Association could not assist him.

There is one exception with respect to the defence of members outside Canada. At the Annual Meeting of the Association in 1944 a motion was passed instructing the Council of the Association to have its General Counsel take such steps as were necessary to allow the Association to defend members in the armed forces who happened to be stationed outside Canada if they needed assistance as the result of their work. Our General Counsel stated this was within the powers of the Association, and while the Association sincerely hopes that no such need for service will arise, it is prepared to give whatever assistance is necessary to members in the armed forces wherever they may be stationed.

4. PRESCRIBING OF NARCOTICS

This year possible criminal actions against members have provided the Association with some worry. One of the cases involved two doctors who prescribed narcotics improperly. One doctor prescribed narcotics without adequate examination of the patient and the other doctor, for the same patient, a known addict, prescribed morphine under circumstances which were highly improper. The addict had the doctor called out of the theatre and the doctor, in the lobby of the theatre, without any examination, issued the prescription. When the Narcotics Division of the Department of National Health and Welfare began making inquiries, both these doctors wrote the Association asking for advice and inquiring what assistance they could be given. It needs to be understood clearly by all doctors that membership in this Association cannot provide them with assistance in defending themselves against criminal actions, nor can any insurance company give assistance under such circumstances. One cannot insure oneself against the performance of a criminal act. In the final analysis a criminal act is a deliberate act, and no individual can obtain any form of protection against a deliberate act which is contrary to the law of the land. Therefore, the Association, in all such cases, advises its members how best to deal with the matters but has to refuse all other assistance.

The commonest of these things for which the Association receives requests for assistance are, in order of frequency, the improper use or prescription of narcotics, the improper use or prescription of alcohol and last, criminal abortions. The laws relative to these things and the penalties for breaking such laws are not only definite and clear but eminently sensible; a doctor must be exceedingly careless, if not actually criminal, who gets into trouble with the authorities about them. All governmental departments with which doctors come into official contact try hard to co-operate with them and give them more than a fair opportunity to state their side of doubtful cases, but the law is the law and must be enforced.

With the end of the European war and the present indications that our participation in the Japanese war will be on a much smaller scale, it is probable that a large number of doctors in the armed forces will be returning to civil practice. A number of these doctors have maintained their memberships in the Association throughout their period of military service. A number, because they were unable to decide where they would be practising after the war, did not obtain licenses and therefore were ineligible for membership. It is hoped that our members will encourage doctors and particularly young men entering practice for the first time to join the Association. Slightly more than one-third of the practising profession now belongs to the Association. Its assistance to members in trouble is sufficient to cover all the ordinary accidents of medical practice. The Association belongs to the profession and is run by the profession, so its assistance is likely to be given promptly and without quibbling. It exists for one purpose and one purpose only, to provide its members with such assistance as is needed.

University Notes

Queen's University

A Refresher Course for all medical officers and ex-medical officers of the Armed Forces will be conducted at Queen's University, Kingston, Ont., commencing on February 11, 1946.

The duration of the course will be three months and the subjects to be covered are Medicine, including Psychological Medicine, Surgery, Obstetrics and Gynæcology, Pædiatrics, Eye, Ear, Nose and Throat, Radiology and Cancer Diagnosis. The syllabus will be sufficiently elastic to permit increased emphasis on any subjects in which the students are particularly interested. It is expected that the fee will be $75.00 per month. Registration is open until the commencement of the course.

A physician should take his fee without letting his left hand know what his right hand was doing; it should be taken without a thought, without a look, without a move of the facial muscles; the true physician should hardly be aware that the last friendly grasp of the hand had been made more precious by the touch of gold.—Anthony Trollope.

Association Notes

THE SEVENTY-SEVENTH ANNUAL MEETING OF THE

Canadian Medical Association

TO BE HELD IN BANFF, ALBERTA, JUNE 10 to 15, 1946

The Seventy-seventh Annual Meeting of the Canadian Medical Association will be held in June, 1946, at Banff, Alberta. This is the first meeting since the close of the War, and should undoubtedly be an outstanding event in Canadian Medicine. We shall welcome back to our midst many of our colleagues who have spent the past few years in the Armed Forces, many of them overseas. They bring back to us records of the advances in medicine which have been achieved in the work of the medical corps in Canada and overseas, and which include many notable triumphs. This fact alone will contribute greatly to the interest and value of this meeting.

Later in this and other notices, we shall have much to say regarding programs, speakers, etc., but we wish first to lay rather special emphasis on certain facts, since these are important to every medical man in Canada who can possibly make plans to attend this meeting.

1. There is likely to be a record attendance at this meeting. With so many men returning, this is especially to be expected.

2. The location of the meeting offers special attractions. Banff in June is a lovely spot, and has plenty to suit every conceivable taste. There is golf, fishing, bathing and canoeing, mountain climbing, tennis, etc. The Banff National Park is a well known resort for tourists, and there are scenic motor drives, trips to the Hot Springs, the Observatory, mountain drives, the government museum, and others that we can here only hint at. The country round Banff in spring and early summer is a riot of beauty in wild flowers, and to our amateur photographers, who are increasing in numbers yearly in our profession, we can promise a rare treat and Sir Nigel of *The White Company* would call "opportunities for advancement". Hunting, we may say here, is not permitted, and firearms will not be allowed within the boundaries of the Park.

3. Many men coming here from the East will doubtless wish to extend their holiday travels to the Coast, to Vancouver, Victoria, or to the Okanagan, Kootenays, Prince Rupert, etc. In other issues of the *Journal* we shall give details about these places, hotel accommodation, travel facilities and so on—so look for these in later articles.

4. All this adds up to this—MAKE YOUR PLANS EARLY: then MAKE YOUR RESERVATIONS EARLY. Remember: accommodation is going to be somewhat limited, no matter how much we try to find room for everyone. Write to Dr. G. A. Lamont, 925 West Georgia Street, Vancouver, Secretary of Housing and Equipment, and DO IT NOW!

Next, as regards hotel accommodation. The Banff Springs Hotel will, of course, be the venue of the meetings; sessions of Sections, Round Table conferences, etc., will all be held there. Those who get accommodation there will, naturally, be in the centre of things, and all entertainment will focus on this spot—one of Canada's great golf courses is a step from the Hotel. There will be various exhibits of especial interest to medical men.

But this is by no means the only hotel in Banff and the vicinity, and we append here a list of hotels, lodges and bungalow camps, with the current rates. Many men will come by auto, and would possibly feel more footloose if they went to some of the lodges or bungalows we speak of. Many can be accommodated at distances of from twelve to twenty-six miles from Banff, which they can reach by good roads with little difficulty, in ample time to attend meetings, etc. Many men will be bringing their wives and daughters, or others of their family, who would find plenty to attract them at points some distances from the centre. One way or another, there should be room for all who wish to come. We draw attention to the Public Camp Grounds on the eastern outskirts of Banff. Anyone who brings a trailer will be quite comfortable and well looked after here.

As regards Banff Springs Hotel, this is a hotel of 600 rooms, and is one of the finest hotels in the chain operated by the C.P.R. Members will be given a special rate, which will be announced and which will include meals in accordance with the American Plan. Two persons will be assigned to a room, and rooms will be allotted in order of application, though certain rooms are being reserved for members of Council, speakers, etc.

As regards other hotels in and around Banff, the subjoined list shows the details required.

Cascade Hotel—45 rooms.
Single $1.00 and $1.50; double $2.00 and $2.50. (Eur.)

*Homestead Hotel—50 rooms.
Single $1.50; double $2.00 (Eur.).

Hot Springs Hotel—22 rooms.
Single $3.00; per week $17.50 (Amer.).

King Edward Hotel—60 rooms.
Single $2.00 up; double $3.00 up (Eur.).
Single $4.00 up; double $7.00 up (Amer.).

Mount Royal Hotel—80 rooms.
Single $2.50 up; double $4.00 up (Eur.).
Single $5.00 up; double $9.00 up (Amer.).
*Y.W.C.A.—45 rooms.
Single $1.25 up; double $1.50 up (Eur.).
Single $2.75 up (Amer.).
*Becker's Bungalows—Acc. 188 persons. (Camp No. 1)
Two persons $4.00 up; each extra person $1.00. (Eur.).
*Becker's Bungalows—Acc. 48 persons. (Camp No. 2).
Four persons $9.00 (Eur.).
*Scratch's Banff—Acc. 70 persons. Bungalows.
Two persons $2.50 up (Eur.).

Sunshine Valley (12 miles from Banff)
Sunshine Lodge—Acc. 75 persons.
Single $7.50; weekly $47.50. Two or more in room $5.50 each; weekly $35.00 (Amer. plan).

Johnston Canyon (16 miles from Banff)
*Johnston Canyon—Acc. 112 persons. Bungalow Camp.
Two persons $3.00 up; each extra person 75c (Eur.).

Castle Junction (20 miles west of Banff)
*Castle Mtn. Junction—Acc. 50 persons. (Auto Court).

Two persons $3.00 up; each extra person $1.00 (Eur.)

Banff-Windermere Highway (26 miles from Banff)
*Castle Mountain—Acc. 112 persons. Bungalow Camp.
Per person $5.50; per week $35.00 (Amer.).

Lake Louise Station and Vicinity (36.5 miles from Banff)
Mountain Inn—10 rooms.
Single $1.00 up; double $2.50 up (Eur.).
*Mt. Temple View—Acc. 64 persons. Bungalow Camp.
Two persons $3.00 to $4.00; each extra person $1.00. (Eur.).
Lake Louise Ski Lodge—Acc. 40 (in chalet).
Single $3.00 up; double $5.50 up (Eur.).
Acc. 25 (in cabins). Two persons, $5.00 up (Eur.)

Lake Louise (40 miles from Banff)
*Chateau Lake Louise—386 rooms. (C.P.R.)
Single $6.50 up; double $10.00 up (Eur.).
*Deer Lodge—75 rooms.
Single $2.50 up; double $4.00 up (Eur.).
Single $5.00 up; double $9.00 up (Amer.).
*Inglenook Lodge and Cabins—Acc. 23 persons.
Double $2.50 up (Eur.).
*Triangle Inn—7 rooms.
Single $2.00 up; double $3.00 up (Eur.).
6 cabins. Two persons $4.00 (Eur.).

*Paradise Bungalow (Camp)—Acc. 60 persons.
Two persons $4.50; each extra person .50 (Eur.).

Ptarmigan-Skoki Region
Temple Lodge—Acc. 20 persons. (5 miles from Lake Louise).
Single $6.00; double $10.00; Weekly $35.00 (Amer.).
Skoki Lodge—Acc. 35 persons. (12 miles from Lake Louise).
Single $6 00; double $10.00; Weekly $35.00 (Amer.).

Moraine Lake (47 miles from Banff)
*Moraine Lake Lodge and Cabins (C.P.R.)—Acc. 12 persons.
Single $6.00 up; two in room, $5.00 up per person (Amer.).

Banff-Jasper Highway
*Num-Ti-Gah Lodge—6 rooms, 4 cabins. (24 miles from Lake Louise).
Lodge $7.00 per day (Amer.). Cabin $5.00 (Amer.).
*Saskatchewan River, Bungalow Camp—Acc. 30 persons. (52 miles from Lake Louise).
Two persons $3.50 up; each extra person .50 (Eur.).

*Summer season only.

Owing to war conditions, some of these accommodations may not be available this year, and prospective guests are advised to make inquiries in advance.

PUBLIC CAMP-GROUNDS.—Tunnel Mountain camp-ground situated on the eastern outskirts of Banff, has accommodation for 4,000 persons. Shelters, camp-stoves, tables, electric light, running water, and sanitary conveniences are provided for the use of visitors carrying their own camping equipment. Automobile trailers are accommodated in a special parking area where electrical plug-in facilities have been provided. The fees for camping permits are $1.00 for ordinary tents for each period of two weeks or less and $2.00 for automobile trailers for each period of two weeks or less. Rate for electricity at Tunnel Mountain camp-ground per day are 10 cents for 3A. fuse and 25 cents for 5A. fuse, payable in advance.

Now a word as to how to reach Banff.

Banff National Park may be reached by railway and motor highway. It is served by the main transcontinental line of the Canadian Pacific Railway and the main stations are Banff and Lake Louise. Rail connections may also be made from points in the United States.

The western section of the Trans-Canada Highway crosses Banff Park from east to west, connecting up with the provincial highway systems of Alberta and British Columbia. From the east, approach may be made via Calgary; from the west, an approach can be made from Vancouver through Revelstoke and Yoho National Parks by an all-Canadian route. This route includes the "Big Bend" section of the Trans-Canada Highway between Revelstoke and Golden, B.C. Approach from the east and north may be made from Edmonton through Jasper via the scenic Banff-Jasper Highway.

Connection from points southwest may be made over a hard-surfaced road from the International Border at Kingsgate, B.C., thence through Cranbrook, Kimberley, to Radium Hot Springs. From this point the route is completed over the Banff-Windermere Highway through Kootenay National Park. From Glacier National Park, Montana, Banff may be reached over a direct hard-surfaced route, by way of the Chief Mountain Highway through Waterton Lakes National Park, and thence over

Provincial Highways 6, 3, 2, and 1, via Pincher, MacLeod, and Calgary.

Following are distances from the town of Banff to well known points:—

Lake Louise, 40 miles; Field, 56 miles; Golden, 92 miles; Revelstoke, 285 miles (via Big Bend); Vancouver, 729 miles (via Big Bend); Jasper, 186 miles (via Banff-Jasper Highway); Calgary, 85 miles; Edmonton, 276 miles; Elk Island Park, 302 miles; Lethbridge, 224 miles; Waterton Lakes National Park, 258 miles; Glacier National Park, Montana (St. Mary's), 263 miles; Radium Hot Springs, 89 miles; Kingsgate, 245 miles; Spokane, 383 miles.

REGISTRATION AND MOTOR LICENCES

All motorists entering Banff National Park must register and secure a transient motor licence as provided for in the regulations governing the use of motor roads in the national parks. The licence fee is $2.00 for an automobile not used for commercial purposes or, if a cabin trailer is attached, the fee is $3.00. This licence, good for the entire season, entitles the holder to the use of all motor roads open to motor traffic in all national parks where a transient motor licence is required. Special licences are issued for motor vehicles used for commercial purposes.

A glance at the following will give an idea of the entertainment available at Banff itself.

Public camp-grounds, less completely equipped than that at Banff, are situated at Johnston Canyon, 16 miles; Castle Mountain, 20 miles; Lake Louise, 40 miles; Moraine Lake, 47 miles from Banff; and on Banff-Jasper Highway at Mosquito Creek (mile 53 from Banff); Bow Pass (mile 64); Waterfowl Lakes (mile 75); Saskatchewan River (mile 89); and The Castelets (mile 103 from Banff.)

RECREATION

Bathing and Swimming.—Outdoor bathing may be enjoyed at Banff at the Cave and Basin and Upper Hot Springs pools. Outdoor pools with heated water are also operated for the use of guests at Banff Springs Hotel and Chateau Lake Louise.

Boating and Canoeing.—Boating and canoeing is available at Banff, Lake Minnewanka, and Lake Louise, where boats and canoes may be hired. The Bow River above Banff and Echo Creek are favourite canoeing courses.

Climbing.—The peaks in Banff Park provide unlimited opportunities for mountain climbing. The Alpine Club of Canada, which sponsors supervised climbing in the Rockies, has a club-house on the Upper Hot Springs road, a mile from Banff. Information concerning the annual camp may be secured from the Secretary at Banff, or from the Government Information Bureau.

Hiking.—Numerous short trails in the vicinity of Banff and Lake Louise provide opportunities for outings on foot. Points easily accessible include Sulphur Mountain Observatory, Tunnel Mountain, Norquay Mountain, Squaw Mountain, Spray Valley, Sundance Canyon, and Upper Hot Springs at Banff, and Plain of Six Glaciers, Lakes Mirror and Agnes, The Beehive, and Victoria Glacier at Lake Louise. Annual walking excursions through the mountains, under supervision, are conducted by an organization known as the Sky Line Trail Hikers. Special information on hikes in the vicinity of Banff, together with maps indicating routes, may be obtained at the Banff Information Bureau.

Fishing.—Good fishing may be enjoyed in the lakes and streams of the park, which have been stocked with various species, including rainbow, cutthroat, Dolly Varden, great lake, and eastern brook trout. Easily reached from motor roads are Vermilion, Altrude, Vista, Boom, Consolation, Bow, Waterfowl, and Twin Lakes, Bow and Mistaya Rivers, and Lake Minnewanka. Egypt, Marvel, Ptarmigan, Baker, Sawback, Spray, Glacier, and Chephren Lakes are accessible by trail.

A fishing licence, issued at a cost of $2.25, is required to angle in the waters of Banff, Kootenay, Yoho, Jasper, and Waterton Lakes National Parks, and is valid in any of these parks during the season. Except, however, any person taking out a non-resident seasonal motor licence shall be accorded free fishing privileges, which shall be extended to all members of the licensee's family dependent on him for support. Children under 16 years of age may angle without a licence when accompanied by the owner of a licence.

As special fishing regulations are in force from time to time, visitors are requested to consult park officers concerning open waters, seasons, and catch limits.

Golf.—The golf course operated by the Canadian Pacific Railway at Banff has a magnificent setting along the Bow River at the base of Mount Rundle. The club-house, parking area, and first tee are a short distance from Banff Springs Hotel. Rates are:—

One round (18 holes), $2.00; one day, $3.00; one week, $12.00; one month, $45.00; season, $75.00. Special family rates are available.

Golf privileges are also available on the Cascade golf course, situated on the Lake Minnewanka Road four miles from Banff. Rates are: 18 holes, 35c.; (50c. Sundays and holidays); per week, $1.75; per month, $2.75; season, lady, $3.00; gentleman, $5.00.

Tennis.—Tennis courts operated by the Government for public use are situated a few hundred yards west of Bow River bridge on the south side of the river. Courts are also available for the use of guests at Banff Springs Hotel.

One word in ending. The responsibility for the success of this meeting will rest mainly on the shoulders of the British Columbia Division of the Canadian Medical Association. The President of the C.M.A., Dr. Wallace A. Wilson, of Vancouver, is in command, and is devoting his whole time and energy to this object, and to those who know him, and that means all Canadian medical men, this is a guarantee that no trouble will be spared to make the 1946 meeting an outstanding one.

Alberta is also generously helping. Banff is technically in their domain, but they have offered to us in British Columbia, their support and help in any way we may ask. When British Columbia and Alberta get together, the result is bound to be good. Plan for an extended holiday with this meeting as the centre. Come on to the Coast, we will welcome you and give you a good time. Vancouver has everything, and if it hasn't, Victoria has. Each of them is at your disposal, and both of them will be cordially glad to see you. The Coast trip to Prince Rupert is one of the most delightful sea trips in the world. Incidentally, if you want to take this, *you must book now.*

Convention Arrangements

The President-Elect, the General Secretary and some members of the Committee on Arrangements are to visit the Banff Springs Hotel the last week in January to make detailed arrangements with respect to the convention.

The Executive Committee has approved of hotel accommodation in the Banff Springs Hotel being provided on the American plan, that is room and meals inclusive. The rate for two in a room is $11.00 per person per day. One person per room, $14.00 per day.

It is anticipated that the attendance will be greatly in excess of the accommodation avail-

able in the Banff Springs Hotel, necessitating the utilization of available hotels and stopping places in the Banff area. Names of these places with rates are announced in this issue.

All members desiring hotel accommodation at the convention are requested to address the Canadian Medical Association Housing Committee, Banff Springs Hotel, Banff, Alberta, indicating number in your party, expected time of arrival and how long you propose to stay.

No information is yet available from the Railways as to whether or not convention rates will be in effect at the time of our annual meeting. Watch the *Journal* for further announcements.

Medical Societies

British Columbia Division

The annual meeting of District No. 4 Medical Association was held in Kamloops, B.C., on October 27.

Dr. R. W. Irving, President, presided over the sessions.

Papers were given by Dr. L. H. Appleby on "Treatment of venous thrombosis—Postoperative", and by Dr. Ethlyn Trapp on "Cancer of the breast".

At the business meeting, which was held following a well-attended dinner, Dr. H. H. Milburn, Chairman of the Committee on Economics, and Dr. A. H. Meneely, President of the British Columbia Medical Association, spoke on matters concerning the profession.

The following officers were elected for the coming year: *President*—Dr. J. R. Parmley, of Penticton; *Vice-president*—Dr. T. W. Sutherland, of Revelstoke; *Secretary-Treasurer*—Dr. H. P. Barr, of Penticton.

Dr. J. R. Parmley was appointed District Representative on the Board of Directors of the British Columbia Medical Association, and Dr. R. W. Irving was appointed District Representative on the Committee on Economics.

The meeting next year will be held in Penticton.

La Société de Chirurgie de Montréal

Séance du 21 novembre 1945.

1. RÉTRÉCISSEMENT CARDIO-ŒSOPHAGIEN: OPÉRATION ET GUÉRISON.—Pierre Smith.

Une vingtaine de vocables ont été utilisés pour désigner cette maladie. Citons seulement parmi les plus courants: cardio-spasme chronique, dilatation idiopathique de l'œsophage, méga-œsophage avec rétrécissement inférieur. L'imprécision nominale correspond également encore à une imprécision pathogénique. Delbet notamment invoque une lésion inflammatoire avec rétrécissement consécutif et dilatation secondaire diffuse sus-structurale. Souvent, à l'état de chronicité, la lésion s'accompagne de médiastinite péri-œsopahgienne qui peuvent donner le change pour des lésions pleuro-pulmonaires et d'ulcère cardio-œsophagien avec hématémèse et zone inflammatoire péri-ulcéreuse.

Le cas rapporté aujourd'hui est celui d'une femme âgée de 45 ans et souffrant depuis 17 ans de troubles digestifs aggravés depuis 3 mois. Ces troubles sont en rapport avec l'atrésie cardio-œsophagienne marquée, tel que démontrée par les examens radiologiques.

Malade en état d'amaigrissement marqué, qu'aggrave des lésions de médiastinite péri-cardio-œsophagienne, avec phénomènes d'hyperthermie légers mais constants depuis plusieurs semaines.

Opération le 12 décembre 1944, technique de Heller: incision de Camargo. Malade suivie pendant huit mois. Suites opératoires dans l'ensemble très satisfaisantes. La malade, en juillet 1945, nous dit qu'elle est bien portante.

2. PÉRIARTHRITE DE L'ÉPAULE AVEC CALCIFICATION.—Antonio Samson.

De 1940, à 1945, le rapporteur a fait une étude de 20 cas de calcification. Diagnostic radiographique d'épaules douloureuses depuis une journée à huit mois.

Traitement: a– 12 cas ont été traités par radiothérapie avec un résultat après un à deux mois; b– 2 cas ont été traités par injection de novocaine selon la méthode de Leriche; c– 4 cas ont été opérés avec d'excellents résultats; d– 2 cas n'ont pas été traités de façon spéciale.

Conclusion: dans tous les cas, les calcifications sont disparues d'après les radiographies récentes. Le traitement doit tendre à faire disparaître la douleur. L'opération est utile dans tous les cas, mais elle est nécessaire surtout dans les cas rebelles aux autres traitements.

Montreal Physiological Society

Meetings of the Montreal Physiological Society were held on November 26 and December 17, 1945. The following papers were presented.

NOVEMBER MEETING

1. Liver function tests on laboratory animals: Florence Robertson and O. F. Denstedt, Department of Biochemistry, McGill University.

2. Nitrogen metabolism after trauma in the rat: H. Cohen (introduced by J. S. L. Browne), University Clinic, Royal Victoria Hospital.

3. A colorimetric method for the quantitative estimation of reducing steriods: R. D. H. Heard and H. Sobel, Department of Biochemistry, McGill University.

4. The lipid-soluble reducing substances of urine as a possible index of adrenal cortical function: R. D. H. Heard, H. Sobel and E. Venning, Department of Biochemistry, McGill University and University Clinic, Royal Victoria Hospital.

DECEMBER MEETING

1. Metabolism of dehydro-iso-androsterone, a urinary ketosteroid: M. M. Hoffman and M. L. Des Barats, University Clinic, Royal Victoria Hospital.

2. Rate of muscle re-innervation following nerve injuries as determined by electromyography: H. H. Jasper, Montreal Neurological Institute.

3. Studies of the amino acids of Penicillin notatum: K. Savard and G. A. Grant, Ayerst McKenna & Harrison Ltd.

Porcupine District Medical Society

Extracts from the Secretary's Report for the year 1945.

For this momentous year that marked the termination of the world's greatest holocaust, our Society will soon close its books. The correspondence has been filed. The minute book has been signed by the President and Secretary. The affairs of the Society have been conducted with an aim towards the development of clinical knowledge, the cultivation of good feeling among members and avoidance of any secrecy.

There have been sixteen meetings. Speakers were chosen on the basis of: (1) Quality: only top-notchers. (2) University: Western, Queen's, McGill and Toronto have all been represented. (3) The subject: subjects were introduced that would interest most members. It was encouraging to see the number of members who attended meetings that appeared to have no relation to their particular specialty. (4) The wishes of the majority: the executive have always been anxious to hear requests for speakers.

The subjects discussed were: Peripheral Vascular Disease; Carcinoma of the Cervix; Vitamins, Their Use and Abuse; Ear, Nose and Throat Problems; Chest Pathology; Anæmia; Treatment of Children; Hazards of Anæsthesia; Fractures; Modern Medicine; Neuro-Surgery. The average attendance was 27.

The speakers from outside were: Dr. Ford Connell, Dr. J. G. Cosbie, Dr. C. Crang, Dr. L. B. Pett, Dr. Grant Strachan, Dr. W. Magner, Dr. C. E. Snelling, Dr. D. J. Galbraith, Dr. W. C. Kruger, Dr. J. L. MacDonald, Dr. George Hall, Dr. W. V. Cone, Dr. C. J. Devins, Dr. A. D. Kelly, Dr. Liang-Chung Cha, Dr. Bertrand Bellemare, Dr. R. F. Brown.

Local speakers were: Dr. William Taylor, Dr. J. H. L. Brennan, and Dr. C. R. MacLean.

Members have come from Moosonee, Kapuskasing, Iroquois Falls, Monteith and Matheson, with visitors from Kirkland Lake, Haileybury, Cobalt and New Liskeard.

Blue Cross Plan.—During the year thirty members of the Society subscribed to the Blue Cross Plan for hospitalization. Since that time many members have taken advantage of this plan for repayment of their own hospitalization or that of one of the family.

Returned Officers.—We have been pleased to welcome back Dr. C. R. MacLean, Dr. G. C. Armitage, Dr. W. Atkinson and Dr. S. J. Jessel from the services. Four members have left to practise elsewhere. Dr. M. Miller has moved to Toronto; Dr. J. H. L. Brennan is with the Workmen's Compensation Board at head office; Dr. A. P. Murtagh is practising near Ottawa; Dr. G. M. Dobbin left Kapuskasing for the south.

Improved Clinical Work.—We understand it is the plan of the Department of Health to provide a resident pathologist at the Department of Health Laboratory in Timmins. The Department has been reminded that such a pathologist is needed at the moment.

We are delighted that Dr. M. B. Hill has signed a contract as radiologist for St. Mary's Hospital. Dr. Hill was here before the Workmen's Compensation Board. He is a trained radiologist. He is also an accomplished pianist. He has been associated with work on the atomic bomb and is an authority on nuclear physics. We know that Dr. Hill will prove a great addition to the x-ray department.

The Silicotic Division of the Workmen's Compensation Board under Dr. William Taylor has been most helpful to the doctors. The number of chest films at their disposal is rarely exceeded on this continent. They exhibit a wealth of clinical material.

The press has been most courteous. Information given to the press should not unethically publicize any individual but it is important that the public should know that the medical profession are trying to give the best service possible.

Correspondence

The Prevention of Silicosis

To the Editor:

With reference to the original preliminary report on the prevention of "Silicosis by metallic aluminium", by Denny, Robson and Irwin, which appeared in your *Journal*, **37**: July, 1937, may I belatedly draw attention to the incorrect reference to my paper on page 11.

The paper on which Denny, Robson and Irwin based their investigations was not "Acute silicosis", *Tubercle*, **14**: 109, 1932, but was "What is silicosis?" *Tubercle*, **16**: 397, 1935.

May I add that, in my opinion, the particles of silica dust act chemically upon the cells of the pulmonary alveoli as particles, and not as solutions (commonly mis-called silicic acids) and that the preventive action of the aluminium powder consists in coating these chemically active particles with aluminium oxide, thereby rendering them chemically inert.

Any further action the particles may have in the lung would be that of simple foreign bodies.

In my opinion there is no foundation for the belief that silica hydrosol is a "protoplasmic poison"—as stated by Gye, Purdy and Kettle; but it may exert some local adsorbent action by virtue of its colloidal structure. Even this is very doubtful.

P. HEFFERNAN

December 12, 1945,
Hop Garden Cottage,
Westergate, Chichester, Eng.

Municipal Doctors Services and the Returned Service Doctor

To the Editor:

The Saskatchewan Government has promised the electors that in the coming five years health will be brought to the people on a formerly unknown scale. The government proposes to do this, as far as I can make out, by honeycombing the province with Health Districts and Health Units. The idea is to have a large central hospital with all specialist services, a smaller district hospital, in which still rather large surgical work can be done, and some small outposts. If I have understood correctly, the burden of the first screening falls on the outpost doctors with his small hospital. I have seen a picture of such an outpost as planned in the future, with examination rooms and small maternity wards, all looking very fine.

This seems to me to be the plan. In practice I am now wondering how all this will be made to work. During the time that I have practised here in the Northern part of Saskatchewan I have been once interviewed by a governmental representative, a lady doctor, on my stand in the question of municipal doctor. That was in Meadow Lake. I was told that as municipal doctor I would get a fixed income of about $8,000 a year, would get a two weeks' paid holiday every year and three weeks for post-graduate work every second year, and she concluded by asking me what more I could want anyway. And, she stressed, think how under the new health scheme we propose you can bring health now to everyone. Think how many people never see the doctor, or too late, for fear of incurring a too large burden, financially, for doctor bills. The lady had been busy organizing the vote for an Union Hospital and saw me only a few minutes just before leaving for an Union Hospital and saw me only a few minutes just before leaving for Regina, figuring that the local doctor was of no importance in starting the scheme anyway. I tried to point a few things out to her. I tried to make her understand that the average returned doctor, and every other doctor I have met so far, cares very little for the amount of money he will get for his work and much more for the work itself, after the forced idleness of the war years. I have never asked anyone whether he could pay or not beforehand, and the Northern Areas Relief Branch has in the past and still is paying for everyone unable to pay me, giving me 50% of the schedule of fees.

The lady could also not understand that I could not wax overenthusiastic over the salary offered. She probably did not take into consideration the fact that of an $8,000 salary the income tax gets about half; that a doctor in the North needs a new car every year with the dreadful roads; that he needs books and magazines to uphold his medical standard, and besides that, wishes to live reasonably well after the years spent in discomfort, far from the family.

But let's forget about the governmental lady doctor. She probably meant well trying to fight for the municipal doctor scheme of her convictions. There is a very unpleasant question involved in the municipal doctors scheme. The fact is, as one town clerk told me quite frankly, the municipality, and that means the town council or the village council, can hire and fire doctors, like teachers or domestic servants, by giving short notice. This was brought home to me practically when I was visited by the secretary of a nearby municipality, wanting a doctor. When I visited the place, the council told me that the municipality was not pleased with the present doctor and wished, if possible immediately, to get another man in his place.

The curious thing was that the doctor to be replaced was a young doctor, who had served that same municipality with superior skill for three years, was about to be discharged from the armed forces, and had invested heavily in a house and equipment in the same municipality. The loss of the contract would practically make his investment valueless and force him to leave the place. I know that I certainly would not like to depend on the good graces and the politics played inside a small town council. I know too well how personal matters of friendship or animosity play parts, how a small vicious group can sway an election locally in any direction they wish. I would not feel secure to establish myself, buy a house or get equipment in such a place, not for any salary. Salaries also mean that the returned doctor will find himself in a position where he has to ask his superior officer, in this case a town councillor or clerk, for permission for any absence outside the permitted two weeks' holiday, and I think that, while I did take it from my captain to limit my liberty, I certainly did not like it while I had to do that. I certainly am not going to go in for that inferior position now. Not if I have not to do it anyway.

There is another aspect also which makes me feel rather dubious about all this municipal business, and that is that the people and I have no choice in selecting the doctor or the patient they like. I often feel that I can not give my best to a patient who dislikes me personally, for no obvious reasons I could explain, or whom I do not like. Now I often tell these people better try another man who might suit them better emotionally. Under the municipal scheme, where every M.D. is a doctor, interchangeable like wheels in a machine, I could not attempt to do so, but the patient can. This seems to me unfairly one-sided.

Under the government scheme many service men would be supposed to go to the outposts and small hospitals. The cities, supposedly

quite adequately served, will not be encouraged as possible places for the young doctors especially. The government is always clamouring for one doctor for 1,000 people. Where I am at present there are 4,000 people around a small village of 200, in which we have transformed a large rickety building into a temporary hospital. Thirty-eight miles to the south is a small 16-bed hospital, 25 miles north a 30-bed hospital is under construction. In my place the government has promised to build an up-to-date 20-bed hospital with 4 isolation rooms. There is one doctor 38 miles from me in Glaslyn, there is one in the small hospital of Rabid Lake. One doctor is wanted by the municipality of Leoville, 25 miles from me to the north, with this 30-bed hospital under construction. To the east is Shell Lake municipality which came into our Union Hospital scheme last year only under the promise that they would have their own doctor. What I am now wondering is what are those five medical men supposed to do? The population is probably such as to give one doctor to 1,000 people. But at present we three men are only just fairly busy. There are only two hospitals, the doctor in Glaslyn has none at his disposal in close proximity. I know that I am by no means overworked. How would it be if there was another hospital of 30 beds created, and two additional doctors? True enough, the community, backed by the government, wants to give me a salary, but, apart from my objections already mentioned against salary contract I can not always sit around twiddling my thumbs.

To me it seems that this system of having the doctors in the country looking after 1,000 people is asking for trouble. The doctor, especially the younger ones, will be mortally bored by having much too much time on their hands. The theorists seem not quite to realize that life in a small country village is not exactly like it might be for them in Regina, with clubs, shows, theatres to take up some outside life, to take up slack evenings and boredom. They also do not realize that returned men especially like the company of other medical men, and are accustomed to talk patients over. All this is absolutely out under municipal schemes. One attraction of country practice at present is just the amount of work possible and the financial reward for that amount of work. For this I can, at least temporarily, overlook not having running water, or a bathtub, or having to improvise my transportation, to go out in subzero weather on speeders, in open sleighs; to work in an ill equipped hospital; to spend my evenings playing cards with my wife or reading the eternal detective stories. But I can now at least always pick up and go for one or two days to the nearest city and blow off steam if I want to and talk with friends again, without having to ask permission of anyone, and can practise medicine to the best of my ability without having to be responsible to any ignorant layman who does not know what it is all about and could call me to task like a pupil.

I figure I have served my three years during this war to be as reasonably free in the exercise of my chosen profession as the people who constitute my patients, the local farmers and merchants, are and want to be. The farmers and merchants I did talk with had their own opinion of the man or the government which could make them paid employees rather than permit them to remain what they are now, free men in a business of their own.

W. BERGMANN

Spiritwood, Sask.

The Annual Meeting, etc.

To the Editor:

I see from the Secretary's Page of January's issue that we are having our convention this year at Banff instead of Vancouver. We certainly had a glorious convention at Montreal last June, and if I could suggest just a little improvement, I trust it will be taken in good part. I went in with a delegate from Brazil, and as he couldn't understand English very well, and I had been brought up partly in Scotland, and a French-Canadian was speaking Canadian, it was a bit hard for either of us to pick up the words of wisdom at times, especially in the large sectional meetings. I think if speakers would enunciate just a little bit better, and speak right into the "mike", it would be better. Let's have more discussion by the meetings-at-large; afterwards in the smaller groups.

Regarding Dr. Chisholm's letter surely it is also recognized that it requires a lot of faith to believe in science, too, and nobody living can prove the theory of probabilities, which requires faith. After all, just as magnetism is not seen, but proved by its effects, so must religion be the same way.

And as for Dr. Hill, and the "near-racket" business, I say: "More power to his pen!"

ROBERT KERR DEWAR

Fort William, Ont.
January 10, 1946.

Permanence, perseverance, persistence in spite of hindrances, discouragements, and "impossibilities:" it is this that in all things distinguishes the strong soul from the weak; the civilized burgher from the nomadic savage—the species Man from the genus Ape—Carlyle.

Special Correspondence

The London Letter

(From our own correspondent)

THE RÖNTGEN CELEBRATIONS

As is only meet in the capital of the country which is the home of Sir William Crooke and Sir J. J. Thomson, London has paid handsome tribute to the memory of Wilhelm Conrad Röntgen on the occasion of the fiftieth anniversary of the discovery of x-rays. The Royal Society, the Royal Institution and the Royal Society of Medicine have all marked the occasion by special meetings. The Royal Society celebrations, which extended over three days, were attended by British, Dutch, French and Swedish scientists, while the Minister of Health attended, and spoke at, the celebrations held by the Royal Society of Medicine. Two themes have dominated all the many speeches—the amazing speed with which the medical implications of the discovery were realized, and the tremendous development which has taken place in physics during the fifty years that separate the discovery of x-rays from the manufacture of the atomic bomb.

THE NATIONAL MEDICAL SERVICE

Parliament and both the lay and the medical press have been full of rumours concerning the Government's plans for the new health service, but, in spite of the intervention of Mr. Churchill himself, the Government have refused to be drawn. Mr. Aneurin Bevan, the Minister of Health, has repeatedly stated that he is anxious to have the full support of the medical profession, and in a letter to the Secretary of the British Medical Association in November he went so far as to say "I certainly have no intention of introducing a Bill until I have given the profession the opportunity to express their views to me".

From the mass of rumours that are now circulating the one definite fact that emerges is that the Government is seriously considering a scheme whereby the hospitals of the country will come under central control, regionally administered. Such a regional administration, under central control, is more likely to appeal to the voluntary hospitals than to the Local Authority hospitals.

AN ACADEMY OF MEDICINE

Interest has been revived in the question of the establishment of an Academy of Medicine, by the announcement that the Royal College of Physicians has decided that the interests of the College would be best served by their remaining in their present premises in Pall Mall. This announcement, contained in a letter to the President of the Royal College of Surgeons, has produced a strong reply from Sir Alfred Webb-Johnson, in which the merits and advantages of a common centre for academic medicine are once again enunciated. In the hope that the physicians may yet change their mind, the Surgeons have decided to keep the present opportunity open by retaining the properties they have already acquired in Lincoln's Inn Fields.

There is a growing consensus that some such Academy of Medicine is necessary for the adequate development of the future medical services of the country. The difficulties of the Royal College of Physicians are fully appreciated, but there is much sympathy with the view of Sir Stewart Duke-Elder that "considerations of immediate finance should not be the deciding factor in a matter which ought to be of great public concern and carries Imperial and international implications of such magnitude."

THE PROBLEM OF THE RHEUMATIC CHILD

In his Harveian Oration delivered before the Royal College of Physicians, Dr. John Parkinson, Sir James Mackenzie's successor at the London Hospital, has put forward a strong plea for a national scheme for the care of our rheumatic children. The magnitude of the problem is well illustrated by his estimate that in this country there are at least 200,000 people between the ages of 18 and 41, with heart disease, mostly rheumatic. The plan proposed consists of compulsory notification, the setting up of hospital schools for the long-term care of rheumatic children, and the establishment of supervisory clinics to promote the health of rheumatic children after leaving hospital. In addition, education of the public is required to ensure that they should realize the real nature of the problem. To co-ordinate these activities, Dr. Parkinson proposes the setting up of a Rheumatic Fever Committee under the ægis of the College. Ultimately he foresees the establishment of a National Council for Rheumatic Fever and Heart Disease.

To our Canadian and American colleagues there probably appears nothing very original in these suggestions, but one of the curious anomalies here is the scant attention that has been given to the problem of rheumatic fever and rheumatic heart disease, apart from the purely clinical aspect.

TRAINING OF DIETITIANS

This country has become very food-conscious during the war years, and the continual stream of advertisements in our newspapers for dietitians for hospitals, schools, factories and institutions, bears witness to the extent to which the nation has taken to heart the lessons learned in the hard school of the grim years, 1939-45. A Special Planning Committee of the Nutrition Society (English Group) has now published a memorandum on the training and qualifications of dietitians, which should go far to establish the status of dietitians and to ensure that in future the feeding of the people

will be in good hands. This committee is of the opinion that there should be a university degree course in dietetics, combining the requisite basic scientific training with all the essential practical work. The standards it adopts are very comparable to those already in use in the Dominions and in U.S.A.

This is a welcome, if rather belated, move, although it will not solve the immediate difficulty of finding adequately trained dietitians for all the vacancies that already exist. During this transition period, however, suitable candidates may well be found among the large number of men and women who have had practical experience in the many works and factory canteens that have played such a vital rôle in the feeding of our vast army of workmen during the war.

WILLIAM A. R. THOMSON.

London, December, 1945.

Miscellany

Doctor Shortage

[*The following extract is from the "Saskatchewan Medical Quarterly", December, 1945. We have no record of the reply from the Saskatchewan licensing body!*—EDITOR.]

A Texas medical man apparently heard of Saskatchewan's need and offers his services in the following letter:

"Let me ask herewith that regular medico-surgical licensure be granted me for practice in Regina, Sask. It is my intention and hope that this will be granted me without undue lapse of time, as, acclimated by 21 years home-owning residence here in this mild climate, it is going to take me some wrestling, so to speak, to get the hang of your cold winter just opening.

"I have already written . . . frankly: I ask that you let me speak with the same frankness here. For, if you do not accord your local physicians in every locality the utmost confidence and real love, you are missing the mark of the best health-service in my estimation. I, l'envoi, have never had any experience under any form of so-called socialization of medicine, such as it is my understanding, obtains now in all of Canada. So I may make some statement or remark that you are at a loss to fully condone: if so, please allow for my fullest open-mindedness in every such case. All my life I have been hunting for just such a place to get into medical practice as I understand now is the case in Canada. Our U.S.A. is coming to it, make no mistake, but we move so slowly—an iceberg is a railroad train in comparison—because we are still under the heel of materialism. I am hunting for a country that has found its way out of this bedlam to a greater or lesser extent and is trying faithfully to come on 'out'. This is my sole reason for coming to Canada to help you in your health-work—no joke, it is the truth.

"Considerations—outside of your giving me license: (1) My fare to the field is to be paid by the municipality concerned—as, of course, I will have to pay my return if and when I do leave it for return. So, if you do not notify these parties, this will take still more time. (2) For my considerable driving for full practice, it will take a boy or man to drive me; and, since I have no car of my own, and do not contemplate getting any, the municipality concerned will have to furnish this boy, and pay him, as well, of course, as paying the cost of upkeep and running this my auto. (3) Since I am to operate one of your hospitals, it is only natural for me to believe that your doctor lives in this hospital; and that, thus, he has his quarters, and full subsistence—this to include laundry-service. (4) Since your snows must be typical, I suppose I will be under the necessity of learning to use snow-shoes? And you will furnish, of course, fuels for heat; and, of course, the lights and everything for the home but, say, my clothing and groceries. I take it there must be times when no car nor sled can get over the drifts of snow? As I was raised in Missouri I am used to some rather heavy snows. I do not like snows but will try to make you the satisfied doctor-surgeon that you need. (5) Doing this outside practice in the traditional methods I will not expect to have any time for anything in surgery but the emergency-work. This means that my surgery must be sent in to some designated central point? I have had unlimited experience in governmental, institutional, and state medicine and all this will be quite natural for me.

"I feel that there may be some who will wonder what axe I have to grind in this changing my location for medical practice; and a proper consideration for them and for myself may make it wiser for me to say more herewith. It is my hope, gentlemen, that you will bear with me, for it is better to have the fullest understanding here at the beginning than to have misunderstanding come out later when I am on the field with you.

"Let me repeat that I am not coming to you in any sense of adventure or search for new thrill. I have my home all out of debt, and some rentals, and a little $ in the bank. But it is not my sense that you will ask me to carry any undue weight of costs for coming to you. I am, therefore, asking that your board issue me my license at no cost to me—after, of course, sending me your blanks and having had your time to pass on them.

"I hope, however, in re, that, as mentioned above, the imminence of winter would seem to dictate that you take the chance of sending for me to come at once, say, by your telegraphing me the ticket to whatever station you have determined for me to take. I assure you I am

100% trustworthy, and faithful and competent; and that, therefore, you will not be sorry. You have all the need since you have that modern tragedy, a closed hospital. Our U.S.A. does not have yet the hospitals erected: you have them ready but nobody to operate them. It does seem that the two nations could carry out some sort of regularity about this first thing, health of the people. Let me observe that from the way our U.S.A. has been coming in this line these last hundred years it will be, at least, 50 more before we shall have attained to the present level of England and Canada.

"Let me look forward eagerly, as I do now, to serving with you in Saskatchewan. I am not looking for winter sports, for hunting, for anything but service in your health-service. I should like, of course, as what doctor does not, to stop enroute, and take some 6 weeks' brush-up on, say diagnosis of Cæsarean section, fractures, and on one or two others, but, if you need me at once without any such interim, just wire me transportation, with the understanding that you are trusting me just the same as I am trusting you, and I'll be on my way to you in, say, 48 hours after its receipt.

"For your faithful encouragement let me repeat as to my personal idiosyncrasies: 'no booze, tobacco, drug, disease, women, gambling, church, lodge, party—none of any'.

"Let me hear from you at your early convenience, and meanwhile, let me remain, . . .

"P.S. N.B.: (1) Recap.—Please send me Application Blanks for Saskatchewan M.D. License ('Regular', of course). (2) Will I not have in my own office a fairly adequate Medico-Surg. Library? (3) Remember—winter soon!"

Lines to a Doctor

For all you have done—the kind, doctory things—
Like making me capsules of butterflies' wings;
For mixing me potent, delectable chowders
Of rare phenolphthalein and barium powders;
For dressing me up in cold, slippery drapes
That tie down the back—*if* they have any tapes;
For stretching me out on a short, shiny table
And poking my tummy as hard as you're able;
For practising darkly photography's art
On my unsuspecting digestion and heart;
For telling me frankly (I'm wiser, if sadder!)
That I own a stomach, likewise a gall-bladder;
For giving me courage to swing by the tail
The gremlins that haunt me and cause me to ail—
For all your good offices, how can I thank you?
O queen among doctors, there's none can outrank you!

E. MARGARET CLARKSON,
December, 1945.

Abstracts from Current Literature

Medicine

Treatment of Subacute Bacterial Endocarditis with Penicillin: Report of cases treated with anticoagulant agents. Goerner, J. R. *et al.*: *Ann. Int. Med.*, **23**: 491, 1945.

Twelve patients with subacute bacterial endocarditis were treated with penicillin given in massive doses and prolonged courses. Eleven of these patients are alive and well, and in several cases more than a year has elapsed since termination of therapy. Heparin proved unnecessary in the cure of the eleven successful cases, nor did its use alter the outcome of the single unsuccessful case. Administration of penicillin in small doses and short courses failed to cure in all of four cases so treated in 1942.

Evidence is presented to show that of the three parenteral routes of administration employed, namely: Continuous intravenous infusion, continuous intramuscular infusion, and intermittent intramuscular injections at two-hour intervals, the first was the most satisfactory. The authors conclude that penicillin alone is an effective therapeutic agent for subacute bacterial endocarditis when the infecting organism is inhibitable by penicillin and provided that the conduct of treatment is carefully determined in each individual case.

S. R. TOWNSEND

The Use of Thiouracil in the Treatment of Patients with Hyperthyroidism. Gabrilove, J. L. *et al.*: *Ann. Int. Med.*, **23**: 537, 1945.

The authors used thiouracil in the treatment of 54 patients. Fifty-one of this group had hyperthyroidism, and three were instances of nontoxic goitre. Thirty-three of these patients have been treated successfully with thiouracil for varying periods of time, the longest period being ten months. Four of this group had recurrent hyperthyroidism and the remainder had diffuse hyperplasia or toxic nodular goitre.

Three patients with hyperthyroidism were successfully prepared for operation with thiouracil. Four patients with hyperthyroidism failed to respond satisfactorily to the drug but were subsequently prepared with iodine and successfully operated upon. In eleven instances, thiouracil therapy was discontinued because of severe toxic reactions.

The following toxic reactions were encountered: conjunctivitis, œdema, drug fever, leukopenia, agranulocytosis. Some sort of toxic reaction was encountered in 31%. The development of agranulocytosis or drug fever were considered as indication for cessation of therapy. Liver and kidney function studies throughout the course of treatment failed to demonstrate any evidence of injury to these organs resulting from the thiouracil.

Because of the frequency and severity of the toxic reactions it was the authors' feeling that thiouracil should be used under the following circumstances (1) in the preparation of iodine-fast patients for operation; (2) in older patients with hyperthyroidism, in whom for one reason or another operation is fraught with great hazard; (3) in patients with recurrent hyperthyroidism who have been operated upon twice or more.

S. R. TOWNSEND

Ventricular Tachycardia. Zimmerman, S. L.: *Ann. Int. Med.*, **23**: 634, 1945.

Ten cases of ventricular tachycardia are reported and discussed from the standpoints of underlying heart disease, causal effects of digitalis, ventricular rates, QRS intervals and the presence of congestive heart failure. Digitalis was not causal in the production of the arrhythmia in any of the reported cases. Five of the ten cases complicated myocardial infarction. In one case no underlying cardiac disease could be demonstrated. In the remaining cases coro-

nary disease, alone, or in association with hypertension was easily established.

Eight of the ten cases were treated with relatively large doses of quinidine. Seven of these patients recovered. In three, paroxysms complicated myocardial infarctions, and were successfully treated. The only death occurred in a patient who had a massive anterior wall infarction and who appeared in a terminal state even prior to the onset of the arrhythmia.

The total amount of quinidine required to terminate the arrhythmia varied greatly from case to case. The least amount given was 24 grains in 24 hours, the most persistent case required 525 grains over a period of nine days. Large doses were given unhesitatingly with extremely gratifying results. Toxic signs and symptoms were negligible. The QRS interval was disregarded as an index of quinidine toxicity.

From a review of this series, and as a result of the perusal of the sparse recent literature, quinidine in adequate, and massive doses if necessary, is recommended by the author in the treatment of ventricular tachycardia. There does not appear to be any unequivocal evidence that its administration following acute coronary occlusions is in any way detrimental.

S. R. TOWNSEND

The Effect of the Prediabetic State on the Survival of the Fetus and the Birth Weight of the Newborn Infant. Miller, H. C.: *New England J. Med.*, **233:** 376, 1945.

The high fetal and neonatal mortality rate among infants born to diabetic mothers, and the increased birth weight of these infants, is well known. It has been shown that such facts also hold true for the infants of mothers who, while not suffering from diabetes at the time of delivery, manifest the disease months or years later. Since all previous study has been upon mothers developing their diabetes before the age of forty the authors extended their observations to infants born of mothers whose diabetes developed after the fourth decade.

A series of 57 cases developing diabetes after the age of forty was compiled from the files of the New Haven Hospital. A control group was drawn from women entering the hospital with other diseases. Review of the history of the pregnancies in each group showed that the fetal and neonatal mortality among the infants in the prediabetic series had been 8.3% and only 2.0% among the infants of the control series. The mortality rate became progressively higher the older the prediabetic mother became while increasing age exerted a negligible effect upon infant mortality among the controls.

The average weight of the infants born to the prediabetic group of mothers was found to be significantly above normal. Maternal obesity was shown not to be a factor in this increased birth weight since the weight of infants born to a series of obese nondiabetic mothers was normal.

NORMAN S. SKINNER

False Positive Hinton Reactions Following Chicken Pox. Kane, L. W. and Henneman, P. H.: *New England J. Med.*, **233:** 407, 1945.

In 22 unselected cases of convalescent chicken pox five developed positive Hinton reactions and one a positive Kahn test as well. These false-positive tests all became negative within 86 days. In no case was the Wasserman reaction positive. The wide variety of illnesses and other conditions capable of producing false-positive serological reactions for syphilis are listed and the need for a critical approach to serodiagnosis is emphasized.

NORMAN S. SKINNER

Family Histories in Tuberculosis. Simpson, S. E.: *Am. Rev. Tuberc.*, **52:** 231, 1945.

The author wishes to emphasize the importance of thorough contact investigation in tuberculosis control. Stress is laid upon the fact that this disease is not inherited, being a family disease only in so far as contact is concerned, and is in particular, a community problem. A series of five groups of cases, with increasing complexity, is presented. The examinations involve fluoroscopic and x-ray study, with tuberculin skin testing of those under age twenty. Reports are submitted to the family physician and in order to promote better co-operation, results discussed with the heads of families concerned. Groups one and two present a graphic portrayal of tuberculosis spread in the family, suggesting an inherited tendency. In groups three, four and five, this is made less apparent as the graphic description, through an ever-increasing interweaving pattern of multiple families in the community, emphasizes dramatically the seriousness of contact in this disease. Comment is made regarding the potential danger of the older age group (not infrequently a grandparent being identified as the probable source) and the known recalcitrant patient in society. A strong plea is made to develop through education a more sympathetic and tuberculosis-minded general public, especially in regard to diagnostic surveys, the isolation of the open case, and adequate therapy.

J. B. ROBINSON

Surgery

Surgery of the Mandible: the Ameloblastoma. Byars, and Sarnat: *Surg., Gyn. & Obst.*, **81:** 5, 1945.

The authors discuss the occurrence and diagnostic features of this tumour, and its pathology.

About 4.5% show local malignancy or metastases. A feature is its proneness to local recurrence if surgery is inadequate. It is not amenable to radiation therapy. Diagnosis is difficult and should be established by biopsy, or frozen section at operation.

Local removal may be sufficient if the patient is willing to report for follow-up over a long period of time. In more extensive cases, resection of the mandible is necessary. If the tumour cannot be removed en bloc, chemical or thermal cauterization of the wound is advised. Various methods of fixation of the jaw fragments are described and a method of restoration of the mandible by bone graft.

L. T. BARCLAY

Some Unusual Aspects of Cancer of the Breast. Daland, E. M.: *New England J. Med.*, **233:** 515, 1945.

Cancer of the breast is usually brought to light by the accidental discovery of a lump in the mammary tissue. By the time symptoms, such as pain, are present, the condition is well advanced. The degree of malignancy varies and the rate of growth also varies with age, the younger the patient the greater its rapidity. It is essential that women be taught to consult a physician immediately any breast abnormality is noted and it is also essential that the physician act promptly if any suspicion of malignancy exists.

Radical mastectomy is necessary with removal of the entire breast, the pectoral muscles and the contents of the axilla. Simple mastectomy is purely palliative but may be worthwhile in cases not suited to the more serious operation, such as cases presenting sepsis in the cancer, old age or poor physical condition of the patient. Simple amputation, however, is not so good as x-ray treatment in an inoperable breast cancer, particularly when the axillary nodes are involved. Many elderly people do not tolerate massive x-ray therapy and surgery is preferable.

Eighteen case reports are presented by the author to illustrate the various points throughout the paper. These include three cases operated upon before the age of nineteen years and a case of recurrence thirty-four and a half years after radical mastectomy.

NORMAN S. SKINNER

Ulcerating Lesions of the Gastroenteric Stoma. Tosseland, N. E. and McDonald, J. R.: *Arch. Surg.*, **51:** 113, 1945.

The authors present the pathological as well as the clinical features of gastrojejunal ulcer in 100 patients

in whom tissue showing the gastroenteric stoma, and the ulcer was available. The incidence of gastrojejunal ulcer has varied from 2 to 4% in reported instances following gastroenterostomy for duodenal ulcer and for gastric ulcer, has been much less. In the present series, resection of the stomach was performed for gastrojejunal ulcer. In 81 of the 87 instances in which it was possible to determine the site of ulceration in relation to the anastomotic line, the ulcer occurred on the jejunal side; in three, on the gastric side and in three, on the anastomotic line. Simple epithelial cysts were found at or near the anastomotic line in approximately one in five cases.

Brunner's glands were found occasionally in the jejunal mucosa adjacent to the stroma. The majority of cases showed gastrojejunitis of moderate or severe degree. There was little or no correlation between the degree of severity of the symptoms and the degree of gastrojejunitis. Suture material and magnesium silicate such as is present in talc, were found in the region of the gastroenteric stoma, but appeared to have little direct relationship to the ulcer. G. E. LEARMONTH

The Late Treatment of Dorsal Injuries of the Hand Associated with Loss of Skin. Cuthbert, J. B.: *Brit. J. Surg.*, **33:** 129, 1945.

Skin may be lost from the dorsum of the hand by avulsion or burn. Healing by natural edge epitheliazation and scar contracture narrows the transverse arch of the hand, with adduction of the metacarpals, particularly that of the thumb. Adduction of the thumb is accompanied by lateral rotation of the thumb on its long axis. Rotation occurs principally at the carpometacarpal joint. The metacarpophalangeal joints tend to be immobilized in extension or hyperextension. The interphalangeal joints are often pulled into flexion. If healing occurs rapidly function may be restored to almost normal by scar excision, skin-grafting, and capsulotomies to free affected joints. Early skin grafting will prevent serious deformity.

Dorsal scarring with loss of extensor tendons is treated by excision of scar; isolation of distal and proximal ends of the tendon (or tendons); capsulotomy of metacarpophalangeal joints done; suture of tendon graft (plantaris) to the distal stump; apposition of abdominal skin-flap; threading of tendon graft through fat of flap, using trocar and cannula; suture of tendon graft to proximal stump; and suture of flap. The base of the flap is separated in three weeks. Similar operation is done if the extensor is adherent in continuity. The value of the direct abdominal skin-flap in late repair of complex hand injuries is considerable.

Destruction of the extensor expansion of the proximal interphalangeal joint requires, for cure, excision of dorsal scarring; stable skin covering; and either arthrodesis in mid-flexion, or arthroplasty and extensor tendon grafting. Less severe cases need only capsulotomy and application of a skin flap: later tendon grafting. A full range of passive movement should be present before tendon grafting.

More complex injuries, involving in addition joints and bones may be grouped into those with bone loss, or non-union of fractures not involving joints; and those with severe joint damage. If joints are not involved treatment is as already outlined, plus bone graft. The extensor tendon graft is inserted after the bone graft has united. If a joint is severely damaged arthroplasty should be considered. The successful transplantation of an entire joint from the foot to the hand is reported: the fourth metatarsophalangeal joint being implanted in the thumb. The flexor surface was placed dorsally in the hand to prevent limitation of flexion by the dorsal capsule.

Tendon suturing was done by continuous suture of fine stainless steel wire or an eyeless needle.

STUART GORDON

Obstetrics and Gynæcology

Heavy Nupercaine Spinal Analgesia in Operative Obstetrics. Resnick, L.: *Brit. M. J.*, **2:** 722, 1945.

Two series totalling 394 obstetrical cases, of which 137 Cæsarean sections and 257 operative vaginal deliveries under spinal analgesia, are presented. No maternal deaths attributable to the analgesic occurred. Heavy nupercaine, 1 in 200, in 6% glucose, was employed in all cases.

The advantages, contraindications and complications of spinal analgesia in operative obstetrics are outlined.

ROSS MITCHELL

Androgen Therapy of Menopausal Symptoms in Cancer Patients. Gusberg, S. B.: *Am. J. Obst. & Gyn.*, **50:** 502, 1945.

The rationale and literature of androgen therapy of the menopausal syndrome are discussed. A group of menopausal patients treated with methyl testosterone is presented. This has been found to be a safe and effective means of controlling menopausal symptoms. In a small group of patients who have had both œstrogens and androgens, a somewhat greater benefit from androgens has been observed.

For the small number of menopausal women who require endocrine therapy the author urges the use of androgens rather than œstrogens in the following groups: (*a*) Patients who have been treated for cancer of the reproductive tract or breast. (*b*) Patients who have been treated for abnormal uterine bleeding during the climacteric. (*c*) Patients who have developed uterine bleeding while under treatment with œstrogenic substances. (*d*) Patients who require endocrine therapy for vasomotor symptoms before their menses have completely ceased. (*e*) Patients who have been addicted to stilbœstrol by long-continued usage. ROSS MITCHELL

Benzyl Penicillin—Clinical Toxicity and Efficacy by Mouth in Impetigo in the Newborn Infant. Gamble, T. O., Miller, L. C. and Tainter, M. L.: *Am. J. Obst. & Gyn.*, **50:** 514, 1945.

The benzyl ester of penicillin given by mouth quickly cleared 16 attacks of impetigo contagiosa in 15 infants in a maternity hospital, and terminated a protracted epidemic. The new form of penicillin is stable at room temperature and can be supplied to the physician ready for use. This material is as effective by mouth in impetigo as is the sodium penicillin administered by injection. The great advantage of being able to give benzyl penicillin orally marks a major advance over the previous injection therapy in handling this difficult condition. The new therapy avoids staining the skin and linen, as in the treatment with dyes, and also does not require the painful surgical removal of crust as is necessary in local therapy of impetigo. The effectiveness of benzyl penicillin demonstrated in this study points out the need for extensive tests of this preparation in other types of injection. ROSS MITCHELL

Placental Senescence and the Onset of Labour. Mandel, H. S., Graff, S. and Graff, A. M.: *Am. J. Obst. & Gyn.*, **50:** 471, 1945.

Estimation of the nucleocytoplasmic ratio (NCR) reveals that the placenta ages in a uniform and continuous manner, from approximately 8.6% at two months to 3.6% at term. The growth of the placenta conforms to theoretical and statistical laws of growth. The toxæmias of pregnancy have no effect upon placental age as measured by the nucleocytoplasmic ratio (NCR). Death of the fetus *in utero* lowers the NCR, *i.e.*, caused increased aging, probably by some autolytic process. There is no correlation between placental senescence and the onset of labour. ROSS MITCHELL

Orthopædics

Restoration of Muscle Power by Heavy-Resistance Exercises. Delorme, T. L.: *J. Bone & Joint Surgery*, **27:** 645, 1945.

The author believes that muscle power is best developed by low repetition exercises against a maximum resistance. Exercises of this type have been used for the development of quadriceps power in three hundred cases with satisfactory results after standard exercises had failed. These exercises against a heavy resistance without weight-bearing will restore a weakened atrophic muscle without any synovitis developing. For quadriceps development, the author used knee extension exercises with weights of from 10 to 30 pounds hung from the foot. The amount of weight used is the maximum amount that can be lifted for 10 to 15 repetitions. The exercises are done first with lighter weights 10 times, increasing by 2 or 3 pound jumps up to the maximum. Similar exercises are used for other muscles and are much superior to joint and group activities. GUY H. FISK

Acute Ischæmia of the Anterior Tibial Muscle and the Long Extensor Muscles of the Toes. Horn, C. E.: *J. Bone & Joint Surgery*, **27:** 615, 1945.

The author believes localized ischæmia of the anterior tibial muscle and long extensor muscles of the toes is a definite entity. These cases show fibrosis of the media, adventitia, and periarterial tissue of the anterior tibial artery with ensuing occlusion. The muscle changes are those seen in typical Volkmann's ischæmia contracture. The condition develops in infantrymen and athletes who make repeated overwhelming demands upon the anterior tibial artery. The musculature of the anterior fascial compartment of the leg is particularly liable to circulatory disturbances because of the anatomical arrangement.

Lumbar sympathetic block with vertical incision of the anterior fascia cruris improve the circulation and permit the return of function to the common peroneal nerve. Arteriectomy is indicated if arterial spasm persists. Idiopathic claw-foot can result from this insufficiency of the anterior tibial artery with ischæmic contracture. GUY H. FISK

Radiology

Roentgen Irradiation in the Treatment of Marie-Strümpell Disease. Hemphill, J. E. and Reeves, R. J.: *Am. J. Roentgenology*, **54:** 282, 1945.

Early diagnosis of ankylosing spondylarthritis offers seeming retardation of the progress of this disease if roentgen irradiation and orthopædic treatment are promptly instituted. Roentgen irradiation has a definite place in the treatment of this disease, but is not adequate by itself. The greatest value of roentgen therapy is that it allows orthopædic correction and prevention of the otherwise inevitable deformities to be tolerated because pain, stiffness, and paravertebral muscle spasm are reduced. Spinal motion and chest expansion are improved. Elevated sedimentation rates are usually reduced and Weltmann coagulation bands approximate normal. The pulse rate decreases, hæmoglobin rises, and patients begin to gain weight. Some totally incapacitated patients can be rehabilitated by such combined therapy.

The pathological granulations of Marie-Strümpell disease are similar to the vascular granulations of other inflammatory reactions known to be radiosensitive. The question whether or not roentgen therapy arrests the production of this granulation before ankylosis develops cannot be answered. It is felt, however, that if roentgen therapy can be instituted early while there is still active granulation (and not complete ankylosis) the best results may be expected. Arrest of the production of the granulating pannus is not too much to hope for and roentgen therapy in carefully applied series as indicated might play a considerable part in this. If this is the mechanism of roentgen reaction, then arrest of early cases before disabling deformities occur should be possible by combined roentgen irradiation and orthopædic treatment. Such a regimen offers hope of more satisfactory results in Marie-Strümpell disease than either therapeutic measure used separately. R. C. BURR

Teratoma of the Testis. Barner, J. L.: *Am. J. Roentgenology*, **54:** 257, 1945.

Sixty-five cases of teratoma of the testis have been followed within the past 33 months. They were found to occur in individuals at the average age of 28 years. Early diagnosis is the most important factor in a high survival rate and cannot be overstressed. Of the cases, 75.21% received medical attention within the first year after the symptoms were noted. The most important diagnostic sign is painless swelling of the testicle with a tendency for the organ to retain its natural shape and outline. Treatment should be early and adequate, relying upon surgery and postoperative irradiation. Surgery included not only an orchidectomy but removal of the cord high at the internal abdominal ring. Irradiation is given early postoperatively and is outlined depending upon the duration of symptoms and presence of demonstrable metastases. Follow-up shows that 72.3% of these 65 cases have replied to correspondence; 10.7% of the total number of cases have died.

It is believed that this plan of treatment, orchidectomy with postoperative irradiation, is superior to orchidectomy or irradiation alone. R. C. BURR

Anæsthesia

Heavy Nupercaine Spinal Analgesia in Operative Obstetrics. Resnick, L.: *Brit. M. J.*, p. 722, Nov. 24, 1945.

Although the safety of spinal analgesia for general surgery is widely recognized, there has always been the more or less expressed conviction that it is "risky" for obstetrical patients. Recently a good deal of literature concerned with spinal anæsthesia in Cæsarean section has appeared, and also the application of spinal analgesia for operative vaginal delivery has been effected. This report covers 394 obstetrical cases of which 137 had Cæsarean section and 256 operative vaginal delivery. One of these patients had two successful spinal analgesias.

The solution employed was heavy nupercaine, 1 in 200, with 6% glucose. Cæsarean section cases received omnopon gr. 1/3 and scopolamine gr. 1/300 about 45 minutes before operation. Atropine gr. 1/100 was added if the spinal analgesia did not produce the required effect and a general anæsthetic became necessary. Ephedrine gr. 1 was given to all spinal analgesia cases at the same time to combat a drop in blood pressure. In the cases requiring operative vaginal delivery, it was usual for the patients to have had twilight sleep or other methods of sedation previously as that supporting sedatives were seldom needed. Ephedrine gr. 1 was given to all patients half an hour before operation.

The dosage of heavy nupercaine for Cæsarean section varied from 1.2 to 1.5 c.c., barbotage being part of the method. Those patients undergoing operative vaginal delivery were given 0.5 to 0.8 c.c. with barbotage. In the 394 spinal analgesias, no maternal deaths occurred which could in any way be attributed to the analgesic.

Headache is increased in obstetrical cases done under heavy nupercaine as contrasted with gynæcological operations performed under the same agent. In 306 gynæcological cases there was an incidence of 6.55% headache. In the Cæsarean section cases, 12.4% complained of headache and in the operative delivery cases there was an incidence of 15.2% so that in the complete series of 393 patients there was an incidence of 14.2%. Spinal headache was therefore encountered

slightly more than twice as often in parturient as in non-parturient women.

The advantages of spinal analgesia in patients requiring operative vaginal delivery are that it is safe in patients with constitutional diseases which contraindicates a general anæsthesia; it is safe in patients with essential hypertension; it tends to prevent obstetric shock, uterine atony and undue uterine hæmorrhage; it affords an absence of immediate postoperative discomfort and vomiting, and pulmonary complications are rare. F. ARTHUR H. WILKINSON

Hygiene and Public Health

How the Employer May Evaluate His Medical Service.
Bulmer, F. M. R. and McCall, G. R.: *Indust. Med.*, **14:** 787, 1945.

That the visit rate and the cost per visit should be used, in addition to the cost per worker per year, when evaluating an industrial medical service, is suggested in this article. The authors, who supervised the medical and health services of Canadian war plants under the Allied War Supplies Corporation, consider that management, particularly those genuinely interested in the welfare of their workers, is anxious to have a yardstick by which the effectiveness of its medical service can be measured. The more progressive employers are rapidly realizing that their medical departments should be used not only for pre-placement examinations and the care of emergency occupational conditions but for the early detection of non-occupational illnesses. For this purpose it is essential that the workers have ready access to the medical department so that medical advice may be given early for even apparently minor symptoms. What seem only trifling conditions may be the initial stages of more serious trouble.

The authors maintain that a properly functioning medical department is an essential part of a plant organization. To determine whether it is properly integrated and whether there is inter-departmental co-operation in the plant, they outline a method which they found of value during surveys of certain industries in Canada. This took the form of a questionnaire completed from information supplied by the heads of the various departments. The program of a minimum industrial medical service as suggested in this article would include pre-employment and periodic examinations, emergency care of occupational conditions and of ordinary illnesses during working hours, initial medical treatment for non-occupational ailments, advice on health problems, plant inspection, and co-operation in programs designed for the welfare and safety of workers. Experience with such a program in the survey described, revealed that from a working population of men and women in roughly equal numbers, approximately twelve visits per worker per year are made to the medical department. At least one-half of these are for minor sickness. About 60% of accident visits and 80% of sickness visits are initial visits; the balance are repeat visits for the same condition. Wherever the visit rate is either too low or extremely high, in a mixed working population, the medical service in that plant should be investigated.

In conclusion, the authors describe the system whereby an employer can evaluate the work of his medical service using as a "work unit", the "visit" to that department. In their experience in medium and large war plants provided with a 24-hour service, the cost per visit was approximately one dollar. Under peace conditions and when operating on an 8-hour day, this figure would be lower. MARGARET H. WILTON

Cases of Exposure to Methyl Bromide Vapours.
Tourangeau, F. J. and Plamondon, S. R.: *Canad. J. Pub. Health*, **36:** 362, 1945.

Methyl bromide is used industrially as a fumigant, as a refrigerant agent and in the manufacture of fire extinguishers. Although cases of poisoning reported over a long period of time have given evidence of its toxic properties, it is only recently that extensive studies to learn more about the physiological effects in men and animals have been conducted. More definite information about this compound is needed. In this article the authors present details of an investigation into three cases of what appeared to be poisoning by methyl bromide in a plant where fire extinguishers were being filled. The material used for filling this particular type of fire extinguisher was either pure methyl bromide or a mixture of 20% carbon tetrachloride and 80% methyl bromide.

The clinical history of two of the cases is given as reported by their physician. Only one of these patients recovered. Other cases of industrial poisoning from methyl bromide, reported in medical literature, have shown a symptomatology which coincided almost exactly with the symptoms found in this latter patient. Contact of methyl bromide with the skin often causes a second-degree burn. The fingers feel cold and some tingling is experienced. Later, a cough develops; the patient is tired and has a feeling of fullness around forehead. He may have flashes of light in the eyes and as the illness grows worse, the eyes become weak. He has a constant taste or smell of burning rubber. Later the hands become unsteady and the movements of hands or fingers jerky and tortuous. Pain occurs in the fingers and the mind becomes dulled. Finally the convulsion stage is reached which may be associated with unconsciousness and incontinence. Death may occur or recovery may be slow with a certain amount of inability to use precision instruments.

Investigation in the plant showed that one of the two exhaust hoods did not effectively control the vapours during the filling operation. The high concentration of methyl bromide vapours found at the breathing level near this hood established the fact that this hood was probably the source of most of the trouble. In the opinion of the authors it is not likely that carbon tetrachloride was involved in the poisoning because of the small amount used in the filling operation and because of its high boiling point. They indicate methods by which conditions were controlled in this plant. MARGARET H. WILTON

Obituaries

EDWARD WILLIAM ARCHIBALD, B.A., M.D., C.M.(McGill); Hon. F.R.C.S.(Eng.); F.R.C.S.[C.]; Hon. F.R.C.S.(Australasia); F.A.C.S.

On December 17, 1945, there occurred the passing of a great surgeon and a greater man. Edward William Archibald died after a long but philosophically borne illness. His medical life covered fifty years of great progress in which he not only played a prominent part but was the epitome of its peculiar characteristics. The era of anæsthesia and asepsis had reached its fulfilment. The purely mechanically expert surgeon had reached his zenith and laid the foundation for those who considered surgery as a physiological branch of therapy and not a simple anatomical ablation of parts. The romance of why certain abnormalities occurred which were amenable to the surgical approach intrigued their minds. Many such names could be mentioned but there were few who had the widely roving mind of Archibald.

Edward Archibald was the son of John Sprott Archibald and Ellen Hutchison, born on August 5, 1872, in Montreal. He was of a truly notable family which has laid its mark, through the professions, on Canada, England, France, Egypt and other parts of the world. Blessed with far-sighted and broad-minded parents all the children became fluent linguists and were nurtured in both British and French culture and tradition. It made them veritable ambassadors of

good will and professional understanding. Edward Archibald could lecture with equal force whether at McGill or the Université de Montréal, at the Sorbonne or at Strassbourg, in Boston or in London or Melbourne. Such was the cherished heritage with which his parents endowed him.

The Archibalds came to Montreal by a devious route from Stirling, Scotland, the place of their original planting. In the early part of the seventeenth century they migrated to North Ireland as appeared to be a custom of the time. One hundred years later—around 1740—the trek was continued to New Hampshire, then to Nova Scotia and finally to Montreal. One cannot help but surmise that these wanderings of successive generations were due to some restless trait, or a resentment of things as they were, or perhaps a seeking of the something which seemed just over the hill or across the water. Archibald inherited or had within him such an intellectual curiosity of seeking, seeking, seeking after truth which always was an ever-changing will-o-the-wisp.

The Student

Archibald received his early education in the schools of Montreal and in 1888 entered the Faculty of Arts of McGill University, graduating as a bachelor of Arts in 1892, after which he proceeded into the Faculty of Medicine, obtaining his doctorate of Medicine in 1896. His formal education was, therefore, like that of most young men of his day as was also his postgraduate training in numerous European centres. There was, however, a deviation from the usual plan, in that he was sent with one of his brothers who followed the legal profession to Montpellier where they added to their knowledge of the French language and culture. It was during this time that he became impressed with the French system of medical education of introducing the medical student as early as possible in his career to the patient as a pathological problem. He always held that the medical student should feel a certain responsibility in the "team" of a teaching clinical department. It was but natural that this should be .the philosophy of one like Archibald who was so deeply imbued with the love of mankind.

It is not within the present tribute to record a complete biography of his writings, which to some extent but not completely reflect his interests. He was an early student of surgical pathology and here was born his constant interest in the neoplastic processes which was continued after his retirement. It was in the nature of irony that his fatal illness was due to one of the rarest of this group of diseases.

There are, broadly speaking, two types of surgeons. The one has interest alone in the dextrous manipulation of the scalpel, forceps and hæmostat. The other has an insatiable curiosity concerning the physiological, histological, and bacteriological causation of abnormalities and how surgery, as a therapeutic discipline, can prevent these disorders or re-establish a perfect physiological substitute. It was in this latter class that Archibald worked undaunted in many regions of the body. An example of this fundamental approach was his constant claim that a student of war surgery should understand the ballistics of foreign bodies upon soft and bony structures. It would seem to the fundamental student that this should be a primary requirement. But how few students of war surgery of the most modern school have mastered ballistics.

He delved into the action resulting from the systemic release of enzymes when he worked on the pancreas. He had an insatiable desire to know the modern concepts of respiration and its control when his mind turned to bring the surgical therapeutic approach to disease of the lungs.

Archibald was no less a student at 73 than he was at 13. He could not be otherwise. The zest, the excitement of the explorer was always his and most wondrous of all it did not exclude him from passing this on to his younger colleagues, nor did it restrict him in taking the greatest enjoyment in many other outlets open to the student who really loves the explorations and reactions of other men's minds. He was the essence of culture.

The Experimentalist

Although Archibald became a great surgeon and had many other striking attributes he was first and always, after being the student, the experimentalist. The dead hand of authority was to him a challenge and a stimulus. Truth was his ideal which could only be wooed and wed by the direct experiment, permitting him to live in intellectual happiness for a short while with one mistress until he was forced to follow another. Thus he became truly a scientific polygamist. It is hard to date his first courting but

Photo by Notman's, Montreal.

Dr. Edward William Archibald

it was probably quite early in his career when he returned from postgraduate study in Europe. He had become well learned in the histo-pathology of the day. But this to him represented the end result. His intellectual inquisitiveness took him farther up the stream which he instinctively knew could only be explored by the experimental method. His humanity forbade his using the human as a deliberate experimental animal. He had probably seen this done in a masked fashion in some places in his travels, and indeed he had on rare occasions spoken his opinions of the brutality of certain "European" surgeons.

He held that every success and every failure in diagnosis and therapy should be carefully analyzed by those responsible in a clinical University Department so that truth should eventually, no matter with what labour, be placed in her true place for future building of more truth. He appreciated how easy it is to forget mistakes and remember successes. He unknowingly agreed with Sir Thomas Lewis that the most easily deceived person is oneself, even through the experimental method. Archibald was rigidly critical of his controls whether human or otherwise. Like many his deductions might at times have been erroneous but his protocols were meticulously accurate. The script was there in the light of day for further generations to build upon.

This reveals an important side-light of him as a student. He never dismissed the work of the past as an inconsequential scrap heap. He knew that men of equal good will and sincerity had been thinking of and working on the same problems as he was, and that their experiments had led them just so far as was permitted by the facilities of their time. He gave them full credit as sincere and intelligent colleagues of a past decade and carried forward their torch, gleaning from here and there a lead to ultimate experimental truth. It would be in the way of wisdom for present day surgical investigators and therapeutists to take a leaf out of his book and be more knowledgeable of the past. There are many experimental facts which are indisputable even if the conclusions may be premature. Who has not so erred, let him cast the first stone! This was Archibald's belief and philosophy.

Beginning with his first studies into the histopathology of tissues removed by surgical methods Archibald had a continuing interest in the etiology of cancer. In 1932 he formed the nucleus of a Cancer Research Section within the Department of Surgery. To this he devoted much of his energy particularly after his retirement in 1936 from active direction of the University and Hospital Department of Surgery. Even his return to active military service only slightly dampened his interest in this elusive problem.

THE SURGEON

As surgeons go Archibald would not probably be considered as a giant of manipulative therapy. He was an anatomical resectionist as good as the best and better than most. He was not one to follow but to lead. He was not content merely to repair but forever sought to forestall serious damage by what one might call preventive surgery. His work on the biliary tract and surgical disorders of the pancreas is an example of this manner of thought. He laid down surgical methods of procedure which were to him a simple matter. What he really desired to know was how the forerunner of these disastrous developments could be detected and how these lesions were initiated in order that they might be prevented. Whatever he put his hand to might follow the manner of the day but unless this approached perfection he was unsatisfied and sought for deeper meaning and intellectual guidance.

It took great courage to undertake the desperate adventure with the odds many times against. This is well seen in his pioneer work on thoracic surgery. I think all his colleagues will give him the credit of being the father of this branch of his profession in the Americas and probably co-parent with one or two others in the world. It is difficult to say when he became intrigued with thoracic surgery, but thumbing through his reprints one would be inclined to believe it was during his war experiences of 1916. Chest wounds apparently interested him as he wrote several articles dealing with them at this time. They were tentative, exploring, inquisitive, as if he saw a broader implication in this realm of surgery. The master mind was again stirred! The 'twenties saw him leading the way to a new era in surgical therapy. This pioneer work opened developments in surgery which will only receive their fullest appreciation in days to come.

Archibald knew the limitations of mankind in general and himself in particular. At one time he ventured in a fairly serious manner into neurosurgery. I well remember a winter day in the early 1930's when we had conversation on this matter. It was late afternoon and the setting sun was tinging the roofs and spires of lower Montreal. He came into my work room to watch the passing of the day. He was unusually quiet for many minutes slumped in deep thought. His silence was respected, knowing patience would soon be rewarded, as it was. "We need a first class young scientifically trained neurologist and surgeon". He knew his limitations! He also knew what science could do! So was born a great school of neurology and neurosurgery! The manner of his bringing this about is another story. It was the idea, the self-effacement and persistence that mattered!

THE TEACHER

There has been controversy as to Archibald's capacity as a teacher. I am sure that this depends upon one's idea of what and how the undergraduate medical student should be taught. It is impossible to make him into a skilled surgeon. This is a matter of technical training on the graduate level. But Archibald firmly believed that the student should understand the fundamentals of physiological and anatomical disorders for which surgery was the therapeutic approach. He had little patience with the traditional concept that students should sit by the hour watching someone operate.

His clinics were clear and concise expositions of these pathological states both as to cause and diagnosis, with a broad enunciation as to the proper therapeutic course to follow.

It has already been mentioned how he was early impressed by the French school in the 90's when students in their first year were initiated into the pathological problems of the wards of the hospital. This seemed to him a sane introduction to the seriousness of their profession and there would appear to be much in its favour; although Archibald at times would agree that it had limitations as to the time spent in relative ignorance of the fundamental problems of physiology and anatomy. Arguments to this end brought out the constant struggle in his mind between an unattainable ideal and his fundamental sense of the practical.

It was always interesting to watch in his philosophy of teaching the combat between the soma and the psyche. There were few who had a deeper appreciation of the spirit of man, but while he unconsciously carried this into his own handling of his individual patients he did not seem to be able to convey this concept to his students. With them he was of the earth—earthy. To his patients individually, a sympathetic spirit. He gave of himself and drove his students to minister to physical ills but unconsciously reserved for himself a privileged place in the inner realms of the patients' confidence. This is probably an attribute of many great "healers" but it is something which cannot be transmitted to the ordinary undergraduate student except by those who profess it openly, and then it becomes part of their philosophy of fundamental diagnosis and therapy which after all is not in the order of therapeutic technique.

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What has been said of Archibald, the teacher of undergraduates, fades into a dim light when one turns to his production of good surgeons. Names and comparisons would be out of place but a simple statement may throw light upon what he did in a comparatively few years. When Archibald became professor of surgery at McGill University and later Physician-in-chief at the Royal Victoria Hospital, the most junior member of the staff was a fellow graduate of Archibald's counterpart in Medicine. There had been nearly thirty years of academic sterility. The next decade revealed the blooming of a crop of outstanding surgical talent. The master was at the helm! How he accomplished this only a few of his intimate colleagues know, and few of the product will ever appreciate his sacrifice of health and monetary rewards to make this possible. He was truly the master who gave all he had of himself to bring about a real school of surgery. Few of the beneficiaries may have grasped this but it is often given to those looking from the dark of the audience to appreciate more fully the drama which is enacted on the stage.

Archibald created a school of surgery in the proper sense of the term, which may be defined as men who combine the experimental method with close study of

contemporary progress and a knowledge of the past. But there is always a rift in the lute! The tax of practice which bears heavily upon the successful physician and surgeon may lead to that forgetfulness of fundamental concepts which Archibald never allowed. He was the master of surgical scientific therapy and had no time for the transient emergency which was never such!

The Man

Archibald's progression in the University and hospital Departments of Surgery until he became head of both Departments are available to all who wish to look them up. Honours came to him in abundance as a proper index of his worth. They need not be recounted here. There are several, however, which are indicative of his wide recognition and of which he was justly proud. In 1927 he was made an honorary Fellow of the Royal College of Surgeons of England; in 1935 an honorary Fellow of the Royal Australasian College of Surgeons which was bestowed on the occasion of the College's official inauguration; in 1937 the University of Paris conferred upon him the degree of Doctor of Medicine, *honoris causa;* and in the same year he received the Henry Jacob Bigelow Medal from the Boston Surgical Society.

Although the world so honoured him, he was held in no less love and admiration by what might be called his domestic circle of colleagues and friends in Montreal. "Eddie" as he was affectionately called, was always expected to be late. This was not due to a disorderly mind but to his unbounded sympathy and love for his fellow man. No task was too great; no patient too humble; no colleague too junior for him to give his time unexpectedly and in full measure. He simply tried to put a bushel of accomplishment into a peck measure, which is a physical impossibility, but he continued to his last day to attempt this task and was ever optimistic of accomplishing the miracle.

The following resolution by the Senate of McGill University is a fine expression of the regard in which he was held.

"The Board of Governors and the Senate of McGill University mourn with the medical profession and the people of Canada the passing of a great surgeon and a gracious gentleman. To learning and scholarship Dr. Edward William Archibald added wisdom, to understanding sympathy; to technical skill that was superb he added research and bold originality.

"Honoured by his colleagues in many lands he wore his laurels lightly and remained to the happiness of his friends a simple man delighting in adventures of the mind and creations of the human spirit; devoted to his patients rather than to fame.

"Such gallant scholars help to make great universities and great traditions. While we mourn his death we are proud and thankful that he was so long among us."

In 1904 he married Agnes Maud Black Barron. For more than forty years they were constant companions and gave each other that understanding which helped greatly to make Archibald the man he was. His tenderness, courage and thoughtfulness for others could only have been of such a high degree through constant nurture from one most close to him.

JONATHAN MEAKINS

Appreciation by W. E. Gallie, Toronto

Looking back over the years, I recall with the greatest vividness the first time I saw Edward Archibald. It was in the operating theatre of the old General Hospital in Toronto, about 1909, at a meeting of the newly formed Canadian Society of Clinical Surgeons, to which as a junior member of Professor I. H. Cameron's staff I came as a guest. As I remember it, the whole meeting was dominated by this young surgeon from McGill. There he sat among the most distinguished surgeons of that day, Cameron, Armstrong, Elder, Primrose, Shepherd and the two Starrs, and by his questions, his comments and skilful direction of the discussion changed the character of surgical education in this country from the purely clinical to the scientific. The impression he left on me that day has remained with me ever since, that true advance in surgery must come from research, and that familiarity with the basic medical sciences is fundamental. The changes that he brought about at McGill will now become a tradition but to this I must add that his influence here in Toronto was powerful too and indeed, it was felt in all the schools of the United States. My personal gratitude to him for the vision he disclosed to me is beyond words.

Since those early days my most intimate contacts with him were as fellow members of the American Interurban Surgical Society of which he was one of the founders. This was a group of thirty-five of the most forward-looking young surgeons of the Eastern United States and Canada. Such men as Whipple, Elting, Hartwell, Phemister, Balfour, Lewis, Cheever and Homans were his intimates. Here again in his young manhood and middle age he was a dominating influence and as he approached the "sear, the yellow leaf" it was delightful to see him gradually change to the character of an elder brother, honoured and revered by all.

But it was in the American Surgical Association that he achieved his greatest prominence. Here in his earlier years he presented to an understanding and approving audience the results of his researches and his views on problems of surgery, physiology and medical education. Then with full maturity he became an attentive listener, a friendly and helpful critic and a veritable "arbiter elegantiarum" both in the debates and in the social amenities which succeeded them. And finally in the golden sunset of his distinguished career it was his good fortune to make what may be his most important contribution. In his address as President of the Association he spoke on "Higher Degrees in Surgery" and pointed out our professional obligations to the people and the necessity of achieving excellence. What he said had much to do with the establishment of the "Boards of Surgery" and with the program of "Graduate Training in Surgery" which has been undertaken by the American College.

We sometimes wonder that Canadians are received so kindly and with such a friendly welcome by our cousins of the United States. One of the reasons is Edward Archibald.

Appreciation by Evarts A. Graham, Saint Louis, Mo.

In the passing of Dr. Edward Archibald, the world has lost a great surgeon who combined with his surgical leadership a warmth and personal attractiveness which made him unusually beloved by his surgical colleagues of both Canada and the United States. At any meeting of surgeons in North America he was always welcome and popular. His delicate sense of humour and his ability to express his disagreement with an author's conclusions in a manner which never gave offense always made an audience listen attentively and with keen enjoyment when he discussed a paper. His skill in the use of fine English was an object of both admiration and reproach to those of us south of the border who too often, I fear, care little for the niceties of expression.

He was one of the pioneers in the development of thoracic surgery, was a charter member and later president of the American Association for Thoracic Surgery. He was one of the first surgeons on this continent to operate for pulmonary tuberculosis, and his early work helped greatly in the development of the modern surgical treatment of that disease. Among other important contributions was his description of the clinical and pathological features of what he termed, for want of a better name, "œdema of the pancreas". At first this contribution attracted little attention, but gradually there has grown a greater realization of the importance of his observations. Interstitial pancreatitis, which the condition really

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THE MAN

Archibald's progression in the University and hospital Departments of Surgery until he became head of both Departments are available to all who wish to look them up. Honours came to him in abundance as a proper index of his worth. They need not be recounted here. There are several, however, which are indicative of his wide recognition and of which he was justly proud. In 1927 he was made an honorary Fellow of the Royal College of Surgeons of England; in 1935 an honorary Fellow of the Royal Australasian College of Surgeons which was bestowed on the occasion of the College's official inauguration; in 1937 the University of Paris conferred upon him the degree of Doctor of Medicine, *honoris causa;* and in the same year he received the Henry Jacob Bigelow Medal from the Boston Surgical Society.

Although the world so honoured him, he was held in no less love and admiration by what might be called his domestic circle of colleagues and friends in Montreal. "Eddie" as he was affectionately called, was always expected to be late. This was not due to a disorderly mind but to his unbounded sympathy and love for his fellow man. No task was too great; no patient too humble; no colleague too junior for him to give his time unexpectedly and in full measure. He simply tried to put a bushel of accomplishment into a peck measure, which is a physical impossibility, but he continued to his last day to attempt this task and was ever optimistic of accomplishing the miracle.

The following resolution by the Senate of McGill University is a fine expression of the regard in which he was held.

"The Board of Governors and the Senate of McGill University mourn with the medical profession and the people of Canada the passing of a great surgeon and a gracious gentleman. To learning and scholarship Dr. Edward William Archibald added wisdom, to understanding sympathy; to technical skill that was superb he added research and bold originality.

"Honoured by his colleagues in many lands he wore his laurels lightly and remained to the happiness of his friends a simple man delighting in adventures of the mind and creations of the human spirit; devoted to his patients rather than to fame.

"Such gallant scholars help to make great universities and great traditions. While we mourn his death we are proud and thankful that he was so long among us."

In 1904 he married Agnes Maud Black Barron. For more than forty years they were constant companions and gave each other that understanding which helped greatly to make Archibald the man he was. His tenderness, courage and thoughtfulness for others could only have been of such a high degree through constant nurture from one most close to him.

JONATHAN MEAKINS

APPRECIATION BY W. E. GALLIE, TORONTO

Looking back over the years, I recall with the greatest vividness the first time I saw Edward Archibald. It was in the operating theatre of the old General Hospital in Toronto, about 1909, at a meeting of the newly formed Canadian Society of Clinical Surgeons, to which as a junior member of Professor I. H. Cameron's staff I came as a guest. As I remember it, the whole meeting was dominated by this young surgeon from McGill. There he sat among the most distinguished surgeons of that day, Cameron, Armstrong, Elder, Primrose, Shepherd and the two Starrs, and by his questions, his comments and skilful direction of the discussion changed the character of surgical education in this country from the purely clinical to the scientific. The impression he left on me that day has remained with me ever since, that true advance in surgery must come from research, and that familiarity with the basic medical sciences is fundamental. The changes that he brought about at McGill will now become a tradition but to this I must add that his influence here in Toronto was powerful too and indeed, it was felt in all the schools of the United States. My personal gratitude to him for the vision he disclosed to me is beyond words.

Since those early days my most intimate contacts with him were as fellow members of the American Interurban Surgical Society of which he was one of the founders. This was a group of thirty-five of the most forward-looking young surgeons of the Eastern United States and Canada. Such men as Whipple, Elting, Hartwell, Phemister, Balfour, Lewis, Cheever and Homans were his intimates. Here again in his young manhood and middle age he was a dominating influence and as he approached the "sear, the yellow leaf" it was delightful to see him gradually change to the character of an elder brother, honoured and revered by all.

But it was in the American Surgical Association that he achieved his greatest prominence. Here in his earlier years he presented to an understanding and approving audience the results of his researches and his views on problems of surgery, physiology and medical education. Then with full maturity he became an attentive listener, a friendly and helpful critic and a veritable "arbiter elegantiarum" both in the debates and in the social amenities which succeeded them. And finally in the golden sunset of his distinguished career it was his good fortune to make what may be his most important contribution. In his address as President of the Association he spoke on "Higher Degrees in Surgery" and pointed out our professional obligations to the people and the necessity of achieving excellence. What he said had much to do with the establishment of the "Boards of Surgery" and with the program of "Graduate Training in Surgery" which has been undertaken by the American College.

We sometimes wonder that Canadians are received so kindly and with such a friendly welcome by our cousins of the United States. One of the reasons is Edward Archibald.

APPRECIATION BY EVARTS A. GRAHAM, SAINT LOUIS, MO.

In the passing of Dr. Edward Archibald, the world has lost a great surgeon who combined with his surgical leadership a warmth and personal attractiveness which made him unusually beloved by his surgical colleagues of both Canada and the United States. At any meeting of surgeons in North America he was always welcome and popular. His delicate sense of humour and his ability to express his disagreement with an author's conclusions in a manner which never gave offense always made an audience listen attentively and with keen enjoyment when he discussed a paper. His skill in the use of fine English was an object of both admiration and reproach to those of us south of the border who too often, I fear, care little for the niceties of expression.

He was one of the pioneers in the development of thoracic surgery, was a charter member and later president of the American Association for Thoracic Surgery. He was one of the first surgeons on this continent to operate for pulmonary tuberculosis, and his early work helped greatly in the development of the modern surgical treatment of that disease. Among other important contributions was his description of the clinical and pathological features of what he termed, for want of a better name, "œdema of the pancreas". At first this contribution attracted little attention, but gradually there has grown a greater realization of the importance of his observations. Interstitial pancreatitis, which the condition really

is, is now becoming more and more recognized. In this connection also there should not be omitted reference to his important work in demonstrating experimentally that the presence of bile in the pancreatic ducts is the important factor in the production of acute pancreatic necrosis. The possible influence of bile in that respect had been suggested by others, but his experiments were very influential in accomplishing an acceptance of the idea.

Archibald was greatly interested in the education of the surgeon and in protecting the public from being subjected to operations by incapable surgeons. He felt that particularly in the United States there was need of an examining or qualifying board of surgeons which should go beyond the existing requirements for fellowship in the American College of Surgeons. His presidential address in 1935 before the American Surgical Association, entitled "Higher Degrees in the Profession of Surgery", emphasized this need. The idea was immediately approved and as a result the American Board of Surgery was organized and began to function in 1937. It was he who appointed the first representatives on that board from the American Surgical Association. The recognition by the U.S. Army and Navy of the value of certification by that board is doubtless responsible in no small measure for the unexcelled record of accomplishment in the treatment of the wounded soldiers and sailors of World War II. This in itself constitutes a fitting memorial of the wisdom and foresight of Edward Archibald.

As evidence of the esteem in which he was held is the fact that to him was awarded in 1936 the Trudeau medal of the National Tuberculosis Association and in 1937 the Bigelow medal of the Boston Surgical Society. He was also an honorary Fellow of the Royal College of Surgeons of England and a corresponding member of several European surgical societies.

His many friends and admirers will always cherish their memory of a lovable, unselfish, distressingly absent-minded character but withal a great surgeon, wise, inspiring and progressive.

Dr. James R. Atkinson, aged 67, of Vancouver, died on December 9 in St. Paul's Hospital following a brief illness.

Born in Ontario, Dr. Atkinson came to Vancouver in 1908. With the outbreak of World War I he enlisted in the medical services holding the rank of major.

In 1938 he was appointed medical officer of the Department of Indian Affairs for Vancouver and district and the Fraser Valley and held regular clinics for the Indians here.

He graduated from Toronto University and Columbia University in medicine. He was also a graduate of the Royal College of Dental Surgery and practised for some time in Glasgow, Scotland, before coming to Vancouver.

Dr. Atkinson is survived by his widow and one daughter, Jean, and one brother, Dr. Harry Atkinson, West Vancouver.

Dr. Robert Howard Carscadden, aged 77, died December 13, aged 77, after several weeks' illness.

Dr. Carscadden was born at Russell, Ont., and graduated from Trinity Medical School in 1901. Prior to going to Lindsay, he practised in Morewood and Douglas. He was former Medical Officer of Health for Douglas and had served as medical officer for the Children's Aid, Lindsay. He was also on the staff of the Ross Memorial Hospital, Lindsay. Dr. Carscadden was a member of Cambridge St. United Church and the I.O.O.F., Lindsay.

Surviving are his widow; a son, Dr. Walter Carscadden, Toronto; and a daughter.

Dr. George L. Clarke, native of London, a graduate of the University of Western Ontario Medical School and practising physician in Detroit for the past 25 years. Dr. Clarke died December 15 after an illness of several months.

Dr. J. C. Clemesha, Buffalo, N.Y., died on October 17, 1945. He was a graduate of McGill University (1891).

Dr Georges-Léo Côté est mort le 7 de décembre. Le Dr Côté a succombé à une crise cardiaque, à sa demeure, 528 rue St-Jean, Quebec. Il était âgé de 44 ans et demi.

Dr. C. C. Cragg, of Peterborough, died on January 2, in his 71st year. He graduated from Trinity College in 1903.

Dr. Levi Murray Curren, of Saint John, N.B., died on December 11, 1945, in Boston where he was undergoing treatment for a condition from which he had suffered for the past eleven years. Dr. Curren was born at Highfield, Queens County on December 16, 1873. His primary education was completed by attendance at Normal School, Fredericton, after which he taught school for several years. His professional courses were taken at Mount Allison University and McGill Medical School. He was a Fellow of the American College of Surgeons. Dr. Curren was a senior surgeon of the Saint John General Hospital for many years and also a commissioner of the same institution. At various times he was a member of the Saint John Municipal Council, the Provincial Legislature at Fredericton, Provincial Board of Health, and for twenty-two years Chairman of the Saint John School Board. Since 1936 he was commissioner and medical consultant for the N.B. Workmen's Compensation Board. In the first Great War Dr. Curren served as a major in the C.A.M.C. in Canada. His friends will long cherish the memory of this bluff, full voiced, friendly and highly social colleague who always had a good word for the distressed and ill and was always the first to defend or excuse an erring mortal no matter how black they were painted. Dr. Curren was a staunch churchman and supported his medical beliefs in local, provincial and Canadian medical societies. He was a past president of the N.B. Medical Society.

A. S. KIRKLAND

Dr. P. W. M. Curry, Cleveland, Ohio, died in November, 1945. He was a graduate of the University of Toronto (1916).

Dr. Ernest R. Dickie died suddenly on December 23, 1945, at Rockville Centre, L.I. He graduated from McGill University in 1922.

Dr. Walter M. Fisk died on December 16, in Montreal at the age of 73. He was born at Abbotsford, Quebec, and was a graduate of McGill University. He is survived by his widow, one son and one daughter.

Dr. W. C. Freeman, Dallas, Texas, died on March 3, 1945. He was a graduate of Trinity College (1876).

Dr J.-L.-M. Genest de St-Bernard de Dorchester, est mort décembre 4. Le Dr Genest était le doyen des médecins de la région. Il pratiquait la médecine à St-Bernard depuis 1889.

Dr. E. J. Hache, of Caraquet, Gloucester County, N.B., died suddenly on December 16, 1945. Dr. Hache was well known on the North Shore of this province as an able practitioner and as a prominent figure in municipal and county affairs. During the war years he was the only doctor in Caraquet and his work was heavy. Dr. Hache was 53 years of age. He was born in Caraquet and educated at Sacred Heart University and Laval, Quebec Medical School. Dr. Hache was a distinguished musician and was generous with his musical gifts. His death was widely mourned and

his loss leaves another gap in the medical coverage in New Brunswick.

Dr. Harry Hart died at St. Joseph's Hospital, London, Ont., on December 12. He was 50 years of age.

Born in Omemee he attended collegiate in Lindsay, served overseas for three years in the first Great War, and graduated in medicine from the University of Toronto in 1922. Dr. Hart practised in Bayham for 10 years, and in Aylmer for 10 years. He was medical officer of health for the Town of Aylmer, and Malahide and Bayham townships.

A member of the United Church, he was also a member of Malahide Lodge, A.F. & A.M., R.A.M. No. 81 in Aylmer, and a member of Mocha Temple Shrine.

A public spirited citizen, Dr. Hart served on the Board of Education in Aylmer for a number of years.

Surviving are his widow; two sons, and one daughter.

Dr. James Howard Hastings died suddenly at his home in Winnipeg on December 9 at the age of 57. Born in Midland, Ontario, he received his early education at Barrie and Midland Collegiate where he took an active interest in athletics, especially hockey. He was a member of the intermediate Ontario Hockey Association champions in 1908, and for two years was the youngest player in Senior O.H.A. Graduating from the Kirksville, Mo., School of Osteopathy, he practised in Calgary, then in 1916 came to Winnipeg. In 1929 he graduated in medicine from the Faculty of Medicine, University of Manitoba. He was a member of the Medical Council of Canada. His widow, two sons and two daughters survive him. One of the sons, Capt. Donald Hastings, R.C.A.M.C., saw service in Italy.

Dr. H. C. P. Hazlewood, senior associate at Muskoka Hospital, died suddenly while making his rounds of the institution Christmas morning. Dr. Hazlewood had been on the medical staff of the National Sanitarium Association for the past 28 years. In 1943 he resigned his position owing to ill health, but continued as senior associate until his death.

Dr. Hazlewood was born in Toronto, February 25, 1889, son of the Rev. J. H. and Mrs. Hazlewood, of Toronto. In 1915 he graduated in medicine from the University of Toronto, having spent the previous summer as an intern at Muskoka Hospital. Shortly after graduation he enlisted in the Royal Canadian Army Medical Corps. Until 1919 he was stationed at Camp Borden. In January, 1919, he came to Muskoka Hospital and has since resided here. His widow survives.

Dr. F. W. Hodgins, Oakland, Calif., died on May 22, 1945. He was born in 1874 and graduated from the University of Toronto in 1896.

Dr. James Nelson Hutchinson died at his home, 171 Yale Ave., Winnipeg, on December 14 at the age of 86. Born in Leskard, Durham County, Ontario, he taught school and attended Canada Business College in Chatham. Coming to Winnipeg in 1884 he was associated with a firm manufacturing agricultural implements. Several years later he began the study of medicine in Manitoba Medical College where he remained for two years, then completed his course in Toronto and Trinity universities. For three years he practised at Richmond Hill, Ont., then, after postgraduate work in New York he returned to Winnipeg in 1899. He continued to practise and reside in Winnipeg till his death, with the exception of several months of postgraduate study in Europe.

Dr. Hutchinson was a member of the Manitoba University Council and a member of the executive of the Manitoba College of Physicians and Surgeons. In 1941 he was made a life member of the Winnipeg Medical Society. He was zealous in good works: Treasurer of the Winnipeg Relief Society, director and chairman of the Board of the Y.M.C.A., active member of Grace United Church, and a strong advocate of temperance. He is survived by his widow and son Dr. Harold Hutchinson, of Winnipeg.

Dr. Nicholas Khmelesky, assistant physician at the Ontario Hospital in Penetang, Ont., died suddenly in his quarters at the hospital on January 1. He was 54.

Born in Russia, he graduated from the medical school of Moscow University. Following the Russian revolution, he went to France and practiced for about 17 years in Paris.

In 1941, after the fall of France, Dr. Khmelesky and his wife went to Spain. From there they came to Canada and Dr. Khmelesky practiced at the Ontario Hospital for the past 14 months.

Dr. Norman D. Kyle, general practitioner in surgery and medicine in Fergus for forty years, passed away in Toronto, December 6, following a lingering illness.

His public service in the community included his acting as medical officer of health of West Garafraxa township for many years, as coroner, and municipal councillor.

Born in West Garafraxa township, he was a lifelong resident of Wellington county. Graduating in the medical class of the University of Toronto in 1904, he had practised in Fergus since 1905 with the exception of the time he spent in serving in the first Great War in the Medical Corps of the British Army in England.

The late Dr. Kyle was also an outstanding athlete having played on champion lacrosse teams in Fergus and also at the University of Toronto.

He is survived by his widow, one son, and one daughter.

Dr. Roy C. Lowrey, consultant for the Toronto Board of Education, died suddenly on December 17.

Dr. Lowrey was prominent in Northern Ontario, where he practiced for a number of years in Englehart. He was the first mayor of Englehart and participated actively in municipal affairs. He was also the doctor for the T. & N.O. Railway. Born in Peterborough, Dr. Lowrey received his early education in medicine from the University of Toronto. He established a practice in Northern Ontario. He was a member of the Masonic Order and of Earlscourt United Church.

Surviving are his widow, a brother, and a sister.

Dr. Aeneas John MacDonnell, who practiced in Winnipeg for about twenty-five years, well known as a clinical teacher, died in Victoria, B.C., on November 23, aged 82.

He received his degree in Arts from Queen's University and in Medicine from McGill, the latter in 1888. Moving to Winnipeg he became a lecturer in pathology in Manitoba Medical College in 1890, and later professor of Surgical Anatomy, then professor of Clinical Medicine and physician to the Winnipeg General Hospital until his removal to Victoria. He was president of the College of Physicians and Surgeons of Manitoba. Nineteen years ago he retired from practice. His widow and one son, John, survive him.

Dr. William Graeme MacKechnie, aged 76, ear, nose and throat specialist, who for 25 years was a medical practitioner in Port of Spain, Trinidad, died on December 9.

Born in Brighton, Dr. MacKechnie was a graduate of Trinity Medical College in 1895. After practicing in Marmora, Ont., for some years he came to Toronto, where he engaged in private practice and served on the staff of the Toronto General Hospital and the Hospital for Sick Children. Retiring two years ago, he left Port of Spain and came to Toronto to reside. He was a member of the Presbyterian Church.

Surviving are his widow, one son, and two daughters.

Dr. A. L. MacRae, who for the past seven years has resided in Sawyerville, passed away on November 29 following a brief illness.

In his 45th year, Dr. MacRae took ill suddenly at midnight and was immediately taken to hospital where he died three hours later.

He was born in Chesterfield, Ontario, and following his marriage to Margaret Brown came to Sawyerville to live. He leaves a widow and two children.

Dr. Damien Masson, well-known Montreal physician, died on December 30, 1945, after a short illness. He was 75 years of age. Born in St. Anicet, Dr. Masson was educated at the University of Ottawa and at the Order of Sulpician Fathers, in Montreal. He studied medicine at the Catholic University of Lille, France, and at the Paris Faculty, where he graduated in 1898. He was subsequently appointed professor of therapeutics at the University of Montreal and was the physician of many members of the clergy and to several religious congregations.

He is survived by his widow, and a son, Yves Masson, recently returned from France after years of internment as a British subject, and his brother, Dr. Mederic Masson, of Montreal.

Dr. James Musgrave died recently in Toronto at the age of 86. Born in Ireland, Dr. Musgrave was a graduate and gold medallist at Dublin University, receiving his Master of Arts degree at the age of 21 and later his medical degree. He also studied at Cork University. He came to Toronto at the age of 24 and established a practice, which he continued for more than 40 years.

Dr. Musgrave was the owner of one of the finest private libraries in the city and was well informed on many subjects. He was keenly interested in world affairs.

Dr. G. P. Nash (on active service), died on November 23, 1945. He was born in 1908 and graduated from Queen's University in 1932.

Dr. H. John Peacock, aged 45, died in Toronto of a cerebral hæmorrhage, on December 13.

Dr. Peacock was born in Toronto. He attended Dufferin Public School and Jarvis Collegiate and graduated from the University of Toronto in 1927. After an internship in the Toronto General Hospital, he took postgraduate work at the Strong Memorial Hospital, Rochester, N.Y. Returning to Toronto in 1930, Dr. Peacock established a practice. He was a member of Scarboro Golf Club, Toronto East Medical Association and St. Brigid's Roman Catholic Church.

Surviving are his widow, a daughter, and a son.

Dr. George Randall, a native of Seeley's Bay who graduated in medicine from Queen's University in 1905 and served with the United States army during the Great War, has died in Milwaukee, where he had practised for many years.

Dr. David Alexander Shirres, died on December 28, 1945, in his 82nd year, after an illness of three years.

He was born on February 3, 1864, in Aberdeen, took his degree in medicine at Aberdeen University, heading his year and came to Canada as surgeon to the Earl of Aberdeen when the latter was appointed Governor-General in 1893. He had been with the Aberdeens in Scotland before they came to Canada. He took postgraduate courses in Europe and after practising for a short time in Harley Street, he established himself in Montreal.

Dr. Shirres was a keen student of archæology and also of birds. He was a member of the Mount Royal Club, the University Club, the Forest and Stream Club, and the Royal Montreal Golf Club and had lived at the last named club for several summers. He had been a member of St. Paul's Lodge A.F. & A.M. He was fond of paintings and proud of his own collection which he enjoyed showing to his friends.

In 1894 he married Miss Edith Thistle, of Ottawa, who predeceased him. He leaves a son, Gordon, and a daughter. Mrs. Ogden Richardson.

Dr. Leon J. Solway, aged 60, died suddenly at his home in Toronto on December 14. Dr. Solway was born in Russia, coming to Toronto as a child from New York. He graduated in arts in 1907 from the University of Toronto and two years later in medicine. After postgraduate work in England he received the degree of M.R.C.P. at London in 1922. He was also a Fellow of the Royal Canadian College of Physicians and a Fellow of the American College of Physicians.

On the staff of the Toronto Western Hospital since 1923, he had been chief in medicine for the last 10 years at Mount Sinai Hospital. Dr. Solway was one of the instigators in the building of the proposed new Mount Sinai Hospital to be erected on University Avenue. He was a past-president of the Canadian Friends of the Hebrew University in Palestine; associated with various benevolent organizations; a member of the Masonic Order and University Avenue Synagogue.

Surviving are his widow, two sons, and two daughters.

Dr. Charles J. Taylor, aged 76, died on December 23 at his home in Toronto. Born at Elora, Ont., Dr. Taylor was a graduate of the University of Toronto, and after postgraduate study in Edinburgh returned to this city to establish a practice. He had been retired for 15 years. His widow survives.

Dr. Thomas Lewis Thomson died at Victoria Hospital, London, Ontario, on December 4 after a long illness. Dr. Thomson was born in North Yarmouth 67 years ago and was a member of one of the pioneer families of the district.

He graduated in medicine at the University of Western Ontario in 1905 and practised in Iowa and Illinois in his younger years. He spent several years in Ann Arbor and for the past year had lived at Kingsmill. Dr. Thomson was a member of the Church of Christ Disciples.

Surviving are his widow and three sons.

Dr. Charles Walter Vipond, co-founder with his brother of the Montreal Children's Hospital, died suddenly on December 22 in his 72nd year at his home, Montreal.

Born in Montreal, he was the son of T. S. Vipond. Educated at Montreal High School he went to McGill University where he graduated in 1897. In 1915 he went overseas as a lieutenant and served in the front lines in France, the Dardanelles, Egypt and Salonika. Afterwards he became second surgery officer to the Duchess of Connaught's Canadian Red Cross Hospital, and later was second in command of No. 9 Canadian Field Ambulance in France. He was promoted to command of this unit, and was awarded the D.S.O. and mentioned in despatches for outstanding work. On returning to Montreal he continued his military service as commanding officer of the 9th Field Ambulance, and was awarded the V.D.

Dr. Vipond was widely known as a surgeon and was past president of the Montreal Medico-Chirurgical Society and also a Fellow of the American College of Surgeons.

He is survived by three brothers, William, Frank and Ernest E. Vipond, K.C., all of Montreal.

Use what talents you possess. The woods would be very silent if no birds sang there except those which sing the best.—*Journal of AVMA.*

News Items

Alberta

The Council of the College of Physicians and Surgeons of Alberta has appointed Lieut.-Col. W. Bramley-Moore, late of the R.C.A.M.C., as Registrar-Treasurer in the place of Dr. George R. Johnson, who has retired after 24 years' service. The Council has asked Dr. Johnson to act in an advisory capacity for another year. Mr. W. G. Hunt, Assistant to the Registrar, has also retired after 26 years' service.

At the recent elections for membership in the Council of the College of Physicians and Surgeons, the following were elected:

District No. 1, Medicine Hat, Dr. W. G. Anderson, Wardlow.

District No. 3, Red Deer, Dr. T. C. Michie, Ponoka.

District No. 5, Northern Alberta, Dr. M. A. R. Young, Lamont.

District No. 7, Edmonton, Dr. T. H. Field, Edmonton.

Drs. Michie and Young are new members, while Dr. Field was re-elected and Dr. Anderson was a former member for the Medicine Hat District.

Dr. A. E. Kennedy, member for Red Deer, declined to stand for re-election on account of ill health.

There is an influx of new registrants, owing to the discharges from the Army. Many graduates of Alberta University, who joined the Forces immediately after their internships and graduates of eastern universities, who were formerly practising in other provinces, after their discharges, decided to come west to practice.

Some former registrants who have been absent for over 20 years are seeking Alberta locations, since the war.

Former Alberta registrants, and Alberta graduates are allowed 50% discount on annual dues for the first year of practice after their discharge.

In former pre-war years the percentage of Alberta men taking postgraduate training was high, and it looks by the number now going in for postgraduate work that this attitude will continue.

Dr. W. Vardy Laing, a graduate of McGill University in the class of 1940, has joined Dr. C. R. Bunn, in Red Deer.

Dr. W. R. Boyd, radiologist with the Dr. McGuffin Radium and X-ray Institute, has gone to Vancouver to accept an appointment in the Vancouver General Hospital.

Dr. Robert Whiting, who has practiced in the Province of Quebec, has joined the Baker Clinic in Edmonton.

The resignation of Dr. George R. Johnson, of Calgary, from his position as Registrar of the College of Physicians and Surgeons, came as a surprise to his many friends in Alberta. Since his appointment to this position and in later years, as honorary secretary of the Canadian Medical Association, Alberta Division, he has worked untiringly for the welfare of the medical profession in this Province. His presence will be greatly missed as representative from Alberta at the Canadian Medical Association meetings.

Mr. W. G. Hunt, in his capacity as assistant to the Registrar of the College of Physicians and Surgeons, for a period of twenty-six years, has given valuable service. His genial and kindly personality known to every registrant in this Province won him many friends.

G. E. LEARMONTH

British Columbia

The College of Physicians and Surgeons of British Columbia has been fortunate in securing the services of Lieut.-Colonel M. R. Caverhill, O.B.E., R.C.A.M.C., who has recently returned from four years overseas, and will assume duties of Executive Secretary of that organization. Dr. Caverhill was formerly practising in Victoria, and interned in the Vancouver General Hospital. He is well known to medical men on the Coast and has a wide circle of acquaintances amongst those in other parts of B.C. He will succeed the late Dr. M. W. Thomas, who lost his life by drowning in November, 1944.

The College of Physicians and Surgeons has organized a plan whereby a Benevolent Fund will be established for the benefit of the medical profession in British Columbia. This will be done by increasing the annual fee payable to the College and is similar to a scheme which has been proposed in Ontario to serve the same purpose.

Men are gradually returning to practice in the Province as they receive their discharge from the Armed Forces. Amongst these are: Squadron Leader E. T. W. Nash, who is with the Department of Veterans' Affairs, who was formerly in the Air Force, as was Flight-Lieut. F. P. Patterson, who is now practising in Vancouver and specializing in orthopædics. Major M. M. MacPherson has returned to Vancouver following his discharge from the R.C.A.M.C.

Capt. T. Dalrymple, who served overseas, has received his discharge from the R.C.A.M.C., and has resumed practice in Vancouver.

Dr. M. McRitchie, formerly in the Naval Medical Services, has returned to practice at Fernie.

Dr. J. F. Haszard is with the Workmen's Compensation Board in Vancouver, following his discharge from the R.C.A.M.C.

Now that the venue of the Canadian Medical Association meeting has been finally fixed at Banff the various committees under the control of Dr. Wallace Wilson, president-elect, are going full speed ahead with the work of organization. A very large attendance is expected and it is intended to make this meeting a record one in every particular.

Hitherto the British Columbia Medical Association and the College of Physicians and Surgeons of B.C. have had two separate committees on economics. These have been merged into one, and it is confidently expected that greater efficiency will thus be secured. An attempt is to be made to publicize the work of this Committee in some way and to keep the members informed on general principles of medical economics.

An interesting and valuable addition to the Library of the Vancouver Medical Association was recently made when the latter was given a holograph letter written by Edward Jenner in January, 1807. The gift was made by Dr. G. E. Kidd, of Vancouver, who received it from a patient of his, Mrs. Violet Stone, of Vancouver. The letter came from the collection of her late father, who formerly lived in Bath. The original letter will be preserved in the Library and is in very fine preservation. It contains a specific reference to vaccination. This letter will be preserved in such a way that it may be viewed by anyone who wishes to see it.

J. H. MACDERMOT

Manitoba

On Christmas Day Dr. and Mrs. J. S. Stewart, of Newdale, Man., celebrated their golden wedding at the home of their daughter and son-in-law, Mr. and Mrs. A. F. Siebert, of Winnipeg.

Dr. Ruvin Lyons, M.R.C.O.G., has been discharged from active service and has resumed practice in Winnipeg.

Clearwater Lake Sanatorium for Indians, north of The Pas, was opened early in October with Dr. John Ridge as Superintendent. There are now 78 patients. Dr. D. F. McRae will assist Dr. Ridge.

Dr. Jack Edmison has joined the staff of Manitoba Sanatorium at Ninette. Dr. Henry Funk has been appointed Honorary Attending Orthopædist to Manitoba Sanatorium.

Manitoba physicians were well represented in the King's New Year's Honours list: Lieut.-Col. W. M. Musgrove, R.C.A.M.C., Lieut.-Col. Morley R. Elliott, R.C.A.M.C., and Wing Commander Lennox Gordon Bell, R.C.A.F., received the Order of the British Empire. Flt.-Lieut. D. B. Stewart (overseas) was made a Member of the Order of the British Empire.

The Department of Veterans' Affairs has announced that Manitoba's first 12-months' course in practical nursing will begin January 14 at St. Joseph's Hospital, Winnipeg. Between 30 and 40 ex-service women have enquired about this new course which is designed to prevent unqualified persons from entering the provincial practical nursing field, and to prevent the exploitation of practical nurses. The Manitoba Legislature recently passed the Licensed Practical Nurses Act setting up the school with a carefully thought out curriculum. ROSS MITCHELL

New Brunswick

Dr. W. J. Murphy, of West Saint John, has joined the Medical Staff of D.V.A. at Lancaster Hospital.

Dr. T. H. Coffey, of Moncton, has been appointed director of Physical Medicine for Eastern Canada with headquarters at Ste. Anne de Bellevue, Que. Dr. Coffey enlisted with No. 14 Field Ambulance in Saint John in 1939, went overseas in 1941 and was demobilized with the rank of lieutenant-colonel.

Dr. Edmund Stiles has established his new practice in St. Stephen on demobilization.

Dr. H. E. Baird who practiced in Chipman, N.B., before the war and who has had wide administrative experience in army hospitals during the war was recently retired with rank of Lieut.-Col. and has now assumed the post of Medical Superintendent of the Regina Hospital in Saskatchewan.

The excellent buildings and equipment of the R.C.A.F. Hospital at No. 10 Release Centre at Moncton are being sought by two nearby hospitals which require more bed capacity. The Moncton City Hospital and the Jordan Memorial Sanitarium at Riverglade both state that this R.C.A.F. set up would greatly ease their present requirements for more bed capacity.

Dr. Robert Baird formerly of Cambridge, N.B., who served with the R.A.M.C. during the war has returned to Canada and is beginning practice in Fredericton.

Col. D. F. Porter, of Saint John, long serving overseas has returned to Canada after a distinguished army career and has been posted to M.D. No. 7 as District Medical Officer. He succeeds Lieut.-Col. R. M. Pendrigh who is on leave prior to demobilization.

Dr. D. C. Malcolm, of Saint John, continues to improve in health and will soon begin a long holiday before resuming his surgical practice.

Dr. P. C. Laporte, M.B.E., of Edmunston, has been appointed to the executive committee of the New Brunswick Museum.

Dr. T. E. Grant, of Saint John, has been made a Fellow of the American College of Surgeons.

Major John McLaughlin until recently president of the Medical Boards at Fredericton is supplying temporarily as Medical Consultant to the N.B. Workmen's Compensation Board due to the death of Dr. L. M. Curren.

Major Geo. Keddy has resumed his practice and hospital appointments in Saint John. A. S. KIRKLAND

Nova Scotia

The many friends of Dr. B. A. LeBlanc, of Arichat, will be sorry to learn that a period of ill health has made necessary an extended stay in hospital.

Dr. C. M. Bethune, recently appointed Superintendent of the Victoria General Hospital, is on an extended trip to Boston, New York, Richmond, Va., and Chicago in connection with plans and equipment for the new institution.

The Department of Public Health of the Province has secured the hospital at Shelburne, recently vacated by the Royal Canadian Navy. This will be operated in part as a civilian hospital and also will have a considerable number of beds available for tuberculosis cases. It is hoped that the hospital will be opened within the next two months. As no hospital previously existed in this section of the Province, it will be greatly appreciated.

Under the auspices of the Red Cross a small hospital has been opened at Advocate. This will be under the supervision of Dr. M. J. Fillmore. A similar hospital has been conducted with great success at Guysboro for some time past, and others are under consideration to be constructed in more remote sections of the Province.

Dr. F. G. Mack, Urologist of the Victoria General Hospital, who has been ill for several weeks, is now reported as making excellent progress. During his absence Dr. V. O. Mader, recently returned from overseas, has been taking care of this department.

Dr. Ian E. MacKay, recently returned from overseas, plans to begin practice in his home town of Stellarton. Dr. J. B. MacDonald, also recently discharged from the R.C.A.M.C., plans to resume his former practice in the same town. H. L. SCAMMELL

Prince Edward Island

Dr. R. D. MacNeill has been appointed Pension Medical Examiner, Canadian Pension Commission, and is now located in Charlottetown. Prior to this appointment Dr. MacNeill was practising at Cape Traverse.

Dr. T. Earle Grant, now practising in Saint John, New Brunswick, has been made a Fellow of the American College of Surgeons. Dr. Grant is the son of Dr. T. V. Grant, M.P., of Montague, Prince Edward Island. Dr. Grant has three brothers doctors, one of whom, Dr. Roy Grant, is practising in Summerside, Prince Edward Island.

Recently $50,000.00 was left McGill University by Dr. Bruce Stewart Smith, who graduated from McGill in 1909, and since that time has practised in Vancouver. He was born at New Glasgow Village, Prince Edward Island. A. J. MURCHISON

Quebec

Aux dernières élections annuelles, le Dr Emile Gaumond, chef du service de dermatologie à l'Hôtel-Dieu de Québec, et professeur de dermato-syphilographie à Laval a été nommé président du bureau médical de l'Hôtel-Dieu. Le Dr R. Lessard, assistant en radiologie a été élu secrétaire.

Le Dr Léon Gérin-Lajoie a été élu vice-doyen de la Faculté de mèdecine de l'Université de Montréal. Il remplace le Dr Oscar Mercier, récemment décédé.

Le Dr Hans Selye, savant de renommée internationale, vient d'être nommé professeur de médecine et de chirurgie expérimentales à la Faculté de médecine de l'Université de Montréal.

Le docteur Lucien Brouha, de Liége, Belgique, directeur des recherches médicales à l'Aluminum Company, de Shawinigan, vient d'être nommé directeur de l'Institut d'Hygiène et de Biologie Humaine de l'Université Laval de Québec.

Le docteur L.-P. Dugal, professeur à l'Université de Montréal, sera l'assistant-directeur de l'Institut.

Le docteur J.-Fenton Argue, régistraire du Conseil médical du Canada, annonce que 71 candidats ont subi avec succès les examens que le Conseil a tenus à Montréal, Winnipeg et Vancouver.

Voici la liste des candidats agréés à Montréal: les docteurs Paul Henry de Varennes, d'Ottawa; G.-J. Gallant, de Howlan, I.-P.-E.; Victor I. Hymovitch, de Montréal; Paul-A. Laguë, de Sainte-Madeleine, Qué.; Jean-L. Lapierre, d'Outremont; Laurier Légaré, de Fort Coulonge, Qué.; Charles-E. Lelaidier et Paul-E., Pouliot, de Québec.

En juin dernier, la "Canadian Society for the Control of Cancer", filiale de l' "Association Médicale du Canada", nommait le Prof. Louis Berger membre de son grand conseil et, en août, elle le priait de faire partie de son bureau de direction. JEAN SAUCIER

La Société Médicale de Montréal, lors de son assemblée générale annuelle, tenue le 18 décembre dernier en l'Hôtel-Dieu, a procédé à l'élection des membres du Bureau pour 1946. Les résultats ont été les suivants: président, le Dr Armand Frappier; vice-président, le Dr Edouard Desjardins; secrétaire général, le Dr Origène Dufresne; trésorier, le Dr François Archambault; secrétaire des séances, le Dr Jean Denis.

Le mardi 18 décembre 1945 avait lieu, en l'Hôtel-Dieu, l'assemblée générale annuelle des membres de la Société Médicale de Montréal. Au cours de cette réunion le président, le Dr Paul Letondal, proclama les premiers lauréats du Prix de la Société, au nom du jury, dont il faisait partie avec les docteurs Pierre Masson, Albert LaSage, F.-L. McNaughton (de McGill) et C.-A. Gauthier (de Québec).

Ce prix, au montant de $1,000 constitue une innovation. Il a été fondé cette année par le Dr Letondal, grâce à la générosité de la maison Ciba. Il est destiné à encourager les jeunes médecins de chez nous dans le domaine de la recherche scientifique, aussi bien en clinique qu'au laboratoire. Seuls les membres titulaires ou correspondants de la Société, de moins de 35 ans, pouvaient participer à ce concours.

Un premier prix de $500 fut accordé au Dr Paul David, pour sa communication sur "la maladie de Hodgkin", publiée dans *l'Union Médicale* (novembre 1945); un second prix de $300 aux docteurs Jean-Léon Desrochers, Marcel Longtin et André Parenteau pour leur travail sur "la hernie du disque intervertébral", paru dans le *Journal de l'Hôtel-Dieu* (mai-juin 1945). Le troisième prix de $200 ne fut pas accordé, le mémoire présenté ne remplissant pas les conditions du concours.

Le président, après avoir félicité les lauréats, exprima le vœu que ce prix fut maintenu "car, dit-il, ce n'est qu'avec les amnées qu'il pourra contribuer efficacement à la réalisation d'une médecine canadienne, d'expression française, vraiment distincte, et pouvant figurer avantageusement sur le plan international".

Saskatchewan

Last November, two of the fourteen regions of the Province of Saskatchewan voted on the establishment of a health region. The remaining regions are showing a keen interest in the establishment of similar arrangements.

The establishment of a health region means that medical officers of health, with suitable staff of public health nurses and sanitary assistants, will begin a complete preventive medicine program. The staff is administered by the Department of Public Health which pays two-thirds of the cost: the remaining third is paid by the region. The regional board may consider other medical developments, such as free hospitalization or medical care.

The Province is now seeking the services of doctors to work as regional organizers and later take over posts as medical officers of health. Preference will be given applicants holding a diploma in public health or a corresponding qualification in public health administration. If an applicant does not hold the diploma in public health, but has suitable qualifications, an effort will be made to provide him with fellowships or other financial assistance. The beginning salary is $5,000.00 per annum, plus travelling expenses.

B. BRACHMAN

General

REPORT ON UNRRA ACTIVITIES IN POLAND

By W. A. Sawyer, M.D.

I left this country early in November on a tour of inspection of UNRRA'S public health activities in Poland. I returned shortly before New Year's Day.

While in Poland, I visited Warsaw, Lublin, Cracow, Breslau, Posen and Lodz. Most of my time was spent in consultation with Poland's public health officials and our own UNRRA staff, and in visiting hospitals, health centres, and medical schools. Lectures on the discoveries and new methods in public health and medicine were given in all these cities as the doctors had been isolated for six long years from the advances in medicine in the outside world.

The picture presented by Poland today is that of a country recovering from a degree of physical destruction and personal suffering hard to imagine and impossible to describe. The people lack almost everything—food, shelter, clothing—everything except courage and the will to pull themselves up again by their boot-straps. The spirit of Poland is as wonderful as the conditions are appalling.

When I was there, the country was bracing itself to face and to cope with the rigours of a hard winter. Long-term plans of reconstruction had been deferred in favour of a plan to deal with immediate and urgent needs. The mind and energies of Poland are concentrated on *now*.

HOSPITAL CONDITIONS

I visited hospitals all over the country. A great many had been destroyed or looted during the war. One consequence was bad over-crowding in most of the remaining hospitals. There is also a serious shortage of equipment. One hospital I visited, while not typical, vividly suggests the kind of difficulties with which the Polish people have to cope. In it I saw patients suffering from contagious diseases lying on

ticks filled with straw and covered with blankets, threadbare and full of holes, which they had brought in with them. No others were available. There is a very serious shortage of sheets. Such as there are are worn and patched.

These shortages are in rapid process of correction through the efforts of UNRRA's officials. I saw UNRRA bedsteads, mattresses and blankets in hospitals or in process of being distributed by trucks.

Food in hospitals, as elsewhere, is extremely short. Adults get practically no milk. A standard meal in one hospital I saw consisted of small potatoes in their skins with a kind of cereal gruel poured over them. The patients received meat or an egg only once in a week or two. The patients' diet was, however, sometimes supplemented by small gifts of food brought in by their friends.

The Problem of Transport

The whole of Poland's economy is seriously affected by the lack of transportation facilities. So is the work of its health officials. The number of doctors in Poland has been heavily reduced by the war. Those that remain are hampered in their work by the lack of means of transportation for getting to and from their patients and the absence of ambulances to bring the sick to the hospitals. One scene remains very vividly in my mind. It was the sight of a patient being conveyed to a hospital in an old horse-drawn farm cart. He lay on straw and was slowly travelling in zero weather the many miles to the nearest hospital. Such sights are normal, not exceptional, in Poland today. Here again UNRRA is making good—with the delivery of ambulances and trucks which are now arriving in increasing quantities.

The Danger of Epidemics

Under the conditions I have described the danger of the spread of epidemics is great. The extent of the destruction in Poland is vastly greater than after the last world war. Indeed the conditions are such as to offer an invitation to the spread of typhus greater than ever before in Poland's history. Typhus is present in widely-distributed areas. There is not, however, as yet a serious epidemic anywhere, for this is the off-season for typhus. The critical period is between now and March of next year. Nevertheless, it should be possible to prevent the outbreak of any serious epidemic through the effective use of DDT delousing powder. Many tons of this powder have been supplied by UNRRA and they are being put to good use. All that is needed now is an effective system for the prompt control of typhus wherever it may appear. The Ministry of Health and the provincial health officials of Poland are showing a real interest in immediately effectuating such a system for the entire country.

The most serious current health problem is that of preventing the spread of typhoid fever. Peace-time preventive measures such as chlorinating water supplies have been seriously affected by the destruction of war. The problem of control is aggravated by the tremendous movements of population both within the country and from without.

In September alone there were 16,569 notified cases of typhoid fever. Those not notified might possibly double the total of cases. This is in contrast with typhus of which only 782 cases were notified. In one province, which I visited, there had been 3,000 cases of typhoid at one time.

Diphtheria too is giving the health officials great concern. We are, at this time of year, at the beginning of the upward curve of its incidence. Poland is short of anti-toxins with which to assist the recovery of persons that have contracted the disease. This increases the death rate. Poland is almost totally devoid of diphtheria toxoid for immunizing the children against diphtheria. This in turn aggravates the threat of the building up of an epidemic.

Here again UNRRA's efforts are concentrated on the speed-up of supplies urgently needed to cope with the seasonal threat.

Tuberculosis is widespread as an inevitable result of food shortages, lack of adequate shelter and similar hardships resulting from the war. This is a serious problem for which no quick solution can be hoped.

Government Co-operation

I was very greatly impressed by the earnestness and competence of Poland's health officials both in the central Ministry of Health and among health officials in the field. Our relations with them are most satisfactory, and they are doing everything in their power to put the supplies provided by UNRRA to good use among those in greatest need. Although the winter months ahead present critical disease problems, the introduction of supplies, of transportation, and of professional health consultants is probably early enough to enable Poland's effective Ministry of Health to cope with the difficulties. UNRRA's Health Division will do its utmost to make a successful campaign possible.

Dr. Alan Moncrieff's Appointment.—Alan Moncrieff, M.D., F.R.C.P., has been appointed to the Nuffield Chair of Child Health tenable at the Institute of Child Health, University of London, as from January 1, 1946. He is a member of the staff of Middlesex Hospital and the Hospital for Sick Children and is also pædiatrician to Queen Charlotte's Maternity Hospital and to the British Postgraduate Medical School. During the war he has served as whole-time physician to the Emergency Medical Service.

Our readers will recall Dr. Moncrieff as our London correspondent over a long period.

Royal College of Physicians of Edinburgh.—At the annual meeting held on December 6, 1945, Dr. David Murray Lyon was elected President, and Drs. W. D. D. Small, C.B.E., L. S. P. Davidson, J. D. S. Cameron, H. L. Wallace, I. G. W. Hill, C.B.E. and D. K. Henderson were elected to form the Council for the ensuing year. Dr. W. D. D. Small, C.B.E., was nominated Vice-president.

Life Insurance Medical Research Fund. — Grants totalling $126,000 to be used for research into the causes of cardiovascular diseases have been made to the medical schools of six universities by the Life Insurance Medical Research Fund.

The recipients of these grants, the first to be made by the Fund since its organization by 147 life insurance companies last fall, are as follows:

Columbia University: Dr. Joseph Victor, of the Department of Pathology, and Dr. Dickinson W. Richards, Jr., Department of Medicine.

University of Minnesota: Dr. Maurice Visscher, Department of Physiology, and Dr. Arthur Kirschbaum, Department of Anatomy.

University of Pennsylvania: Dr. H. C. Bazett, Department of Physiology.

Southwestern Medical College, Dallas, Texas: Dr. Gladys Fashena, Department of Pædiatrics.

Washington University, St. Louis: Dr. John R. Smith, Department of Internal Medicine.

Yale University: Dr. John R. Paul, Section of Preventive Medicine.

Altogether the Fund will have available over $500,000 during the next year, to be expended to assist existing research projects in the field of heart and arterial diseases and for support of younger Research Fellows who without that support would be lost to the medical research field. Together these diseases constitute the number 1 killer in America.

This is the largest amount to be devoted in any one year to research in this field, with a total of $3,500,000 in prospect over a six-year period.

Bert Shepard Assigned to the Office of the U.S. Surgeon General.—First Lieutenant Bert Shepard, who

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attracted nation-wide attention last summer when he resumed his professional baseball career as pitcher for the Washington Senators three days after receiving his GI artificial leg from Walter Reed General Hospital, has re-entered the service at the request of the Surgeon General to aid in a program designed to help amputees get the greatest use from their prostheses.

In May, 1944, Lieutenant Shepard's P-38 was shot down over Germany. He suffered the loss of the lower part of his right leg, the operation being performed by German surgeons. After eight months in German hospitals and prison camps, he returned to the United States aboard the *Gripsholm* in February of last year.

Wearing a crude artificial leg fashioned from Red Cross materials by a fellow Canadian prisoner, Lieutenant Shepard was sent to Walter Reed General Hospital where he received a GI prosthesis. Within three days after his fitting, he was working out with the Washington Senators and later signed with them. He plays football and has been clocked in the 100-yard dash at 12.05 seconds. He is the wearer of the Distinguished Flying Cross, Air Medal with three clusters and the Purple Heart.

The Wellcome Historical Medical Museum's Studies in the History of Medicine: The Development of Inhalation Anæsthesia. — The Wellcome Historical Museum was founded and endowed by the late Sir Henry Wellcome of the firm of Burroughs Wellcome and Co., who bequeathed his fortune for advancement of medical science. The museum has arranged to publish the first of its postwar series of Research Studies in the History of Medicine. This will be a work on the development of inhalation anæsthesia, by Dr. Barbara M. Duncum of the Nuffield Department of Anæsthetics, University of Oxford, and formerly on the staff of the Wellcome Historical Medical Museum. The work deals exhaustively with the history of inhalation anæsthesia in England, in the United States and on the European continent from the scientific and clinical points of view. It shows as well the influence of the general current of events on this branch of surgery. Important features of the work are investigation of the various changes of opinion in regard to the physiological action of anæsthetics, the evolution and practical application of inhalers and other apparatus and the introduction of anæsthetic drugs during the period under review. The work, which is illustrated by over 160 photographs and drawings, should prove of special interest to the student of medical history, since it shows how modern anæsthetic methods have grown from nineteenth century beginnings. It also should be of great practical value to anæsthetists and research workers in anæsthetics. The book will make approximately 600 pages.

Department of National Health and Welfare. — Hon. Brooke Claxton, Minister of National Health and Welfare, announced on December 19, 1945, appointment of four chiefs of divisions within the department.

They are Dr. L. V. Janes, of Edmonton, as chief of the dental health division; Dr. B. D. B. Layton, of Toronto, venereal disease control; Dr. R. G. Ratz, of Kitchener, civil service health; and Dr. C. G. Stogdill, of Toronto, mental health.

A graduate of the Chicago College of Dental Surgery, Dr. Janes served in World War I and later practised in Edmonton. In 1939 he was appointed district dental officer in M.D. No. 13, later going overseas as officer commanding No. 5 Canadian Dental Company. Since 1942 he has been director of dental services overseas.

Dr. Layton, who succeeds Major George Leclerc as chief of the venereal disease control division, studied medicine at the University of Toronto and in London, England. He served as resident physician at St. Michael's Hospital, Toronto; as staff physician at the Saint John Tuberculosis Hospital, Saint John, N.B.; and as assistant medical director for G. D. Searle and Company, Chicago. He joined the R.C.A.M.C. in 1942 and since 1944 has been venereal disease control officer for the Canadian Army overseas, having general administrative responsibility for the control program overseas and direct supervision of V.D. control in the United Kingdom.

Dr. Ratz, chief of the civil service health division, graduated from the University of Toronto and practised medicine in Kitchener. During World War I he served in the R.N.V.R. and in World War II as officer commanding the 24th Canadian Light Field Ambulance overseas and later in the directorate of medical services at National Defence headquarters in Ottawa.

A native of Seaforth, Ont., Dr. Stogdill specialized in psychology and psychiatry at the University of Toronto. Since 1931 he has been director of mental hygiene in the public health department of the City of Toronto. He recently returned from overseas duty with the medical branch of the R.C.A.F.

All four of the officers appointed, Mr. Claxton said, have good records in their respective fields, and all of them have overseas service, two of them in both world wars.

The A.P.A.A. (ninth) 1947 Exhibition to be held at Atlantic City, on the occasion of the Centennial Session of the American Medical Association, will also be the occasion of the judging of the "Courage and Devotion Beyond the Call of Duty" art prize contest ($34,000 in savings bonds).

This contest was originally scheduled for the 1946 A.M.A. Session but has been postponed one year, upon the best advice, in order to give more physicians an additional year to complete their art pieces on this special prize subject.

For further information regarding both the San Francisco 1946 and the Atlantic City 1947 Art Exhibits, physicians may write either the American Physicians Art Association Secretary-Treasurer, Dr. Francis H. Rodewill, Flood Building, San Francisco, Calif., or the sponsor, Mead Johnson & Co., Evansville 21, Ind.

Book Reviews

Diseases of the Nervous System in Infancy, Childhood and Adolescence. F. R. Ford, Associate Professor of Neurology, Johns Hopkins University. 2nd ed., 1143 pp., illust. $16.50. Thomas, Springfield; Ryerson Press, Toronto, 1944.

The second edition of this textbook is a welcome one. It has had no rivals in its special field. This is a comprehensive text covering very thoroughly the field of neurological disease as seen in infancy, childhood and adolescence—and when one scans the chapters it is evident that there is very little neurology—with the exception of degenerative vascular diseases—which does not belong to this period of life, or have its beginning at this time.

The new edition contains much new material. There is an excellent introductory section on anatomy, physiology and clinical and laboratory examinations. The sections on anatomy and physiology of the immature nervous system are particularly valuable. Neurological diseases are presented under the larger categories of Prenatal diseases, Heredofamilial and degenerative diseases, Infections and parasitic invasions, Toxic and Metabolic disorders, Vascular lesions and Circulatory disorders, Neoplasms, injuries due to physical agents, the Epilepsies, diseases of the Autonomic Nervous System and Muscles.

The final Chapter on "Syndromes and Symptom Groups" discusses certain symptoms such as spastic palsy, muscle atrophy, pain, coma, fits and mental deficiency, relating them to the various diseases described earlier in the text. The reviewer feels that

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this type of discussion by symptoms is a very useful one, and should be employed more generally in textbooks.

No attempt is made to cover the field of child psychiatry, though there is a good section on "Psychologically determined disorders simulating organic diseases of the Nervous System" at the end of the book.

This is a book that should be much better known than it has been in the past, and is highly recommended as a reference book for neurologists, pædiatrists, and general internists with an interest in neurology.

The History of Surgical Anæsthesia. T. E. Keys. 191 pp., illust. $6.00. Schuman's, New York, 1945.

The word "superlative" may be applied without reserve to this book. The full sweep of the story of anæsthesia is conveyed to the reader from antiquity to the most recent developments with admirable balance and brevity, informed by the author's association with authorities embracing all fields of anæsthesia. It is particularly refreshing to find that the past does not, as in so many histories, overshadow the modern, but is in its proper place as the background for the significant present, thus assuring a perspective that makes the book on the textual side a work of art. This effect is enhanced by superb illustrations and quality of bookmaking and publishing.

This book should awaken the medical profession to the fact that it is being favoured by authors within its ranks and by publishers like Mr. Henry Schuman with works of scholarship and discerning art. The medical historical trend of the last twenty years is bearing rich fruit.

For the research student and the bibliographer the book contains an unrivalled list of references and chronological records. Indeed one-half of the pages of the text are devoted to this purpose, which make it an invaluable volume for medical libraries. Essays by Dr. Chauncey D. Leake and Dr. Noel A. Gillespie serve as prologue and epilogue to the author's central dramatic work.

One cannot imagine a more timely or handsome way in which the current centennial years in anæsthesia may be celebrated. This volume is a worthy tribute to the spirit of man presiding over its sphere at the head of the surgeon's operating table.

Manual of Tropical Medicine. T. T. Mackie, Executive Officer, Tropical and Military Medicine, Chief, Division of Parasitology, Army Medical School, *et al.* 727 pp., illust. $7.00. Saunders, Phila.; McAinsh, Toronto, 1945.

This is one of the military medical manuals prepared under the auspices of the Division of Medical Sciences of the National Research Council of the United States. Its authors are temporarily on the staff of the American Army Medical School and indeed the manual is an epitome of the course given there. It is written by the three authors, and six collaborators and innumerable other authorities have been consulted in its preparation. It is divided into eleven sections dealing with viruses, rickettsiæ, spirochætes, bacteria, fungi, protozia, helminths, nutritional diseases, miscellaneous conditions, medically important arthropods and laboratory diagnostic methods. Each section is divided into sub-sections describing the various causal conditions in its group and each subsection briefly discusses the distribution etiology, epidemiology, pathology, clinical characteristics, diagnosis, treatment and prophylaxis.

The book is a good one, especially for a student who is attending a course of instruction; its arrangement by etiology may make it less desirable to the practitioner. It is extremely compressed, however, and sometimes this leads to an unintentional dogmatism, which gives the reader an incomplete or incorrect impression. Thus, for example, drugs used extensively in British practice in the treatment of amœbiasis are dismissed as "seldom necessary or desirable". Elsewhere it leads to actual errors—thus there is a confusion between brood-capsules and "daughter cysts" in Hydatid, while the photograph of cœnuri in the heart of a sheep, calls for fuller explanation.

There is moreover a certain disproportion in the amount of compression given the different groups of organisms. The virus diseases particularly suffer in this respect.

However, these are comparatively minor flaws in an otherwise excellent book. It should have a deserved success as a teaching manual in classes of tropical medicine. In tropical practice it will usefully supplement one of the standard clinical texts such as Manson, Rogers and Megaw, Napier or Strong-Stitt.

Preventive Medicine. M. F. Boyd, Field Staff Member, International Health Division, Rockefeller Foundation. 7th ed., 591 pp., illust. $6.50. Saunders, Phila.; McAinsh, Toronto, 1945.

This is a comparatively small volume, but has practical information concisely given. Written primarily for United States readers, there are conditions described rarely met with in Canada. The book is too small to cover the whole field of preventive medicine, but is to be recommended as a reference work and practical guide for readers with an interest in preventive medicine and with previous knowledge of the subject.

Textbook of Anæsthetics. R. J. Minnitt, Lecturer in Anæsthesia, University of Liverpool, and J. Gillies, Consultant in Anæsthesia, Department of Health for Scotland. 6th ed., 487 pp., illust. $7.50. Livingstone, Edinburgh; Macmillan, Toronto, 1945.

This comprehensive work is written in a colourful and descriptive style. The fundamental processes in the study and practice of anæsthesia, mechanical, physiological and pharmacological are observed throughout the text.

The authors have described the preparation and premedication of patients for anæsthesia. A brief description of the various anæsthetic agents and techniques is excellent for students. There are chapters on endotracheal, dental and obstetrical anæsthesia, oxygen therapy and accidents of anæsthesia. The authors draw freely from their wide personal experience and point out the complications which may occur with different drugs and methods. They also emphasize the modern trend of thought in anæsthesia that the anæsthetic drug is not as important as the qualifications of the anæsthesiologist. All anæsthesiologists might do well to read and study this excellent practical book.

Studies of Burns and Scalds. Medical Research Council. 210 pp., illust. 4s. His Majesty's Stationery Office, London, 1944.

This publication outlines the results of a prolonged study by a team of surgeons and laboratory workers at the Royal Infirmary, Glasgow.

The report details the observations made on about 400 in-patients and 2,000 out-patients during 1942-43. It is divided into six parts written by the various members of the scientific team. It is produced in very readable form with photographs, line drawings and charts. Factual data are given and commented upon. The confirmation of previous observations by other workers, and the demonstration of much that is new or little appreciated was accomplished by this team of scientists. Emphasis is placed on the prevention of contamination and the control of infection in burns. The techniques which were used are detailed. The sections on blood changes in the early and late stages, and the biochemical changes show the value of having a skilled group work on a problem of this sort which has such diverse aspects. The final section on post

mortem findings adds further confirmation to previous observations.

This book is most valuable reading to all those who must treat burns, be they general practitioners or specialists.

Neuro-ophthalmology. D. J. Lyle, Lecturer on Neuro-ophthalmology, Medical College of the University of Cincinnati. 395 pp., illust. $14.00. Thomas, Springfield; Ryerson Press, Toronto, 1945.

In his preface the author states that his purpose in writing this book is "to present a more or less unified neuro-ophthalmological reference book", and thus save the postgraduate and undergraduate in ophthalmology the necessity of digging his way through many and copious texts in order to find the required information. He has largely succeeded in his purpose. He has produced what might be called a "quick" reference book. However there is not sufficient detail for it to be a good students' book. Also to meet a full usefulness as a quick reference book some improvement in the setting out of the subject material is required. An increased use of tables, headings, and headed paragraphs would be of great assistance in finding one's way through the book.

The author has produced a most readable and comprehensive text which does co-ordinate our present knowledge very well. A very full bibliography has been appended. The illustrations are many and for the most part excellent. Those reproducing photographs of brain lesions are particularly good. Those reproducing retinal photographs do not clearly illustrate the lesions discussed. All in all the reviewer found the book quite instructive.

A Textbook of Ophthalmology. S. R. Gifford, Formerly Professor of Ophthalmology, Northwestern University Medical School, Chicago. 3rd ed., 457 pp., illust. $4.60. Saunders, Phila.; McAinsh, Toronto, 1945.

This is the third edition since 1938 of this excellent little book. With each edition the material has been improved, streamlined a little, and expanded a little to keep up with the times. With the result that it has become an increasingly popular text. In this edition sections have been added to deal more adequately with ptosis, contact lenses, cyclodiathermy and epidemic keratoconjunctivitis. There also have been additions to the illustrations. This book is a most readable and useful guide to ophthalmology to both the medical student, student in ophthalmology, and general practitioner.

Penicillin and Other Antibiotic Agents. W. E. Herrell, Assistant Professor of Medicine, Mayo Foundation. 348 pp., illust. $5.75. Saunders, Phila.; McAnsh, Toronto, 1945.

This is an excellent, practical summary of a very important and fast-developing subject. It is worthy of being read by all practising physicians, as it will ensure a foundation of knowledge of antibiotic therapy, a field which promises to widen rapidly.

The majority of the pages are devoted to penicillin which is well covered from all practical points of view. The final six chapters summarize the present knowledge of other antibiotics with detailed description of those which appear to possess clinical significance (tyrothricin, streptothricin and streptomycin).

François Magendie, Pioneer in Experimental Physiology and Scientific Medicine in XIX Century France. J. M. D. Olmsted, Professor of Physiology, University of California. 290 pp., illust. $5.00. Schuman's, New York, 1944.

This is the first full-length study of the life and work of the father of experimental physiology, and as such it is a notable addition to the growing corpus of medical history being written on this continent. Magendie is one of the great figures of the flowering-time of French medical thought. His personality has tended to be obscured by that of his famous pupil, Claude Bernard; and Professor Olmstead, who has already shown himself a penetrating biographer of nineteenth century French medicine has admirably recreated the figure of the sturdy crusader whose work incorporated experimental physiology as the basis of scientific medicine.

Professor Olmstead's book is written with fine historical sense and feeling. Magendie's life is seen against the stirring background of revolutionary and Napoleonic France. His early rise to maturity in the brilliant medical scene of the time, his forthright championing of the experimental approach against the reactionary prejudices of the Faculty, his epoch-making series of experiments on the central nervous system are finely developed by the author who can bring his own physiological knowledge to the task of critical analysis. One of the best things in the book is the discussion of the Bell-Magendie controversy concerning the discovery of the sensory and motor functions of the roots of the spinal nerves, and it is here that Dr. Olmstead shows his ability to handle historical data.

Altogether the book is a first-rate piece of historical analysis and historical writing. It establishes Magendie's claim to be in large measure responsible for the scientific spirit which gave France her period of ascendancy in medicine and which directed the currents of medical thought during the nineteenth century. The book is well documented and its format does the publisher great credit.

BOOKS RECEIVED

Thakkar's Intravenous Therapy. K. V. Thakkar, Bombay University, Late Chief Medical Officer to the States of Palitana and Idar. 2nd ed. 349 pp., illust. Rs. 8/8. Kothari Book Depot, Parel, Bombay 12, 1944.

The Problem of Changing Food Habits. Report of the Committee on Food Habits 1941-1943. 177 pp. National Research Council, Washington, D.C. Copies available upon request to professional individuals or agencies in the field.

Fractures and Dislocations. Edited by H. Rolleston and A. Moncrieff. 104 pp., illust. 7/6d. *The Practitioner*, London, 1943.

Bacteriology and Allied Subjects. L. Gershenfeld, Professor of Bacteriology and Hygiene and Director of the Bacteriological Laboratories at the Philadelphia College of Pharmacy and Science in Philadelphia. 561 pp., illust. Mack Publishing Co., Easton, Penn., 1945.

Nervousness, Indigestion and Pain. W. C. Alvarez. 488 pp. $5.00. P. B. Hoeber Inc., New York, 1943.

The Cook's Recipe Manual for Navy, Army, Air Force, Munitions Plants, Camps and Schools. E. Middleton. 225 pp. $2.00. Ryerson Press, Toronto, 1943.

Starvation in Europe. G. H. Bourne. 144 pp., illust. 5s. G. Allen & Unwin Ltd., London, 1943.

First Aid Surgical and Medical. W. H. Cole and C. B. Puerstow. 351 pp., illust. $3.00. Appleton-Century, New York, 1942.

Manual of the Diseases of the Eye. C. H. May. 18th ed., 520 pp., illust. $5.00. William Wood, Baltimore; University of Toronto Press, Toronto, 1943.

Poet Physicians, an Anthology of Medical Poetry Written by Physicians. Compiled by M. L. McDonough. 210 pp. $6.75. Thomas, Springfield; Ryerson Press, Toronto, 1945.

Surgical Nursing. E. L. Eliason, John Rae Barton Professor of Surgery, University of Pennsylvania Medical School *et al.* 7th ed., 584 pp., illust. Lippincott, Montreal, 1945.